MANUAL NO. 993-043019-001

OWNERS and SERVICE MANUAL for





Echoplex EP-4



contents

Introduction

The Maestro Echoplex is the pioneer of on stage echo units. Today it remains the most popular, versatile unit of its kind and operates equally well with instrument or voice. It is a product of careful design engineering to enhance the musicians artistry and is endorsed by leading musicians.

The first section of the manual presents the general features of Echoplex EP-3, EP-4 and Sireko ES-1 followed by specifications, operation, general information and care and service of each model. Further information is supplied by the head alignment instructions, schematic diagrams for specific serial numbers, various views of Echoplex models and an overall selected replacement parts list.

Maestro Echoplex EP-3

The Maestro Echoplex EP-3 has the ability to turn off the erase and record heads. By turning off the erase head you can achieve "Sound on Sound", an exclusive with Maestro Echoplex. "Sound on Sound" means you can play along with and add effects to what you previously played.



Maestro Echoplex EP-4

The Maestro Echoplex EP-4 controls over the effects have been improved including echo tone controls, a recording level knob and a recording level LED indicator. Two inputs now allow you to play into your mixer. More rugged construction means the Maestro Echoplex EP-4 is even more reliable then ever.



Maestro Sireko ES-1

The Maestro Sireko ES-1 by Echoplex offers all of the fine features of the Echoplex with the exception of "Sound on Sound". The echo delay and echo repeat speed controls afford countless possibilities for the value conscious musician.



Maestro Echoplex EP-3

FEATURES

- Echo On/Off can be controlled with foot switch.
- Playback feature — record and playback in accompaniment.
- Special Effects — created by increasing the echo feedback with the sustain control.
- Exclusive Echoplex replaceable two minute tape cartridge included.
- Foot switch, cables and carrying case included.
- Wow and flutter less than 0.3%.
- 15 pounds total weight.
- 13 inches wide, 18-1/4 inches deep, 8-1/8 inches high.
- Operates on 110 volt, 60 cycle AC current.

USE OF "SOUND ON SOUND"

- Make the first recording with the ECHO/ SOUND ON SOUND switch in ECHO position.
- Place the switch in SOUND ON SOUND position. The original recording will be played back and recorded at the same time. You may now add another recording while listening. Repeat this procedure and record each time to add as many recordings as you wish.
- If you wish to just listen and practice before recording, press playback foot switch inserted into FOOT SWITCH PLAYBACK jack. You will not be recording or erasing during this time.
- ECHO/SUSTAIN control is not operative during the "Sound on Sound" recordings.

POWER SOURCE

CAUTION

The Echoplex may be damaged if connected to an incorrect power source.

- Connect to 105/125 volt, 60 cycle power source.
- Turn on ECHO SUSTAIN control and allow five minute warmup period to allow for cold condensation, that may exist, to disappear.
- If motor fails to start, slap sides of cabinet. This will realign bearings if unit has been roughly handled during shipment.
- Connect OUTPUT jack into INPUT jack of amplifier.
- Connect instrument into INPUT jack of Echoplex.

RECORD LEVEL ADJUSTMENT

The Echoplex contains new circuitry to reduce "hiss" and distortion. For best results, adjust the record level as follows:

- After connecting the Echoplex to your equipment, turn the ECHO VOLUME control to "1" and listen to the tone.
- Turn ECHO VOLUME control to "9" and repeat the same tone.
- If the volume of the tone is not equal with the ECHO VOLUME at "1" and "9", insert a small screwdriver into the hole marked RECORD LEVEL and slowly adjust until the tone is equal with the ECHO VOLUME at "1" and "9".

NOTE

Do not turn RECORD LEVEL clockwise too far or "hiss" will increase.

- When RECORD LEVEL adjustment is made properly, the Echoplex will perform properly with no distortion on a minimum of "hiss".

ECHO VOLUME CONTROL

For balancing between instrument and echo sound.

- Turn ECHO REPEATS control to "1".
- Turn VOLUME (mixer) Instrument/Echo control to left.
- Pluck one string and you will hear straight through sound.
- Keep plucking string and slowly turn VOLUME control clockwise and you will hear an echo sound introduced into the guitar's original sound.
- Slowly continue to turn VOLUME control clockwise and you will hear an increase in echo volume and a decrease in straight through sound and finally you will hear only the recorded, or echo sound.

ECHO SUSTAIN CONTROL

To increase number of echoes following the sound through.

- To select desired number of echo repeats, mute the guitar strings . . . staccato . . . so as to make a short sound.
- Slowly turn ECHO SUSTAIN control clockwise and you will hear the number of echo repeats increasing to the point where they take over and "run away" or feed back.

NOTE

This EXTRA POWER is there only to compensate when tape heads become worn or cleaning has been neglected.

- In your setting of the ECHO SUSTAIN control, when you come to the "run away", back off, and turn control counterclockwise until the "run away" is corrected.

ECHO ON/OFF CONTROL

- Provided to turn echo on/off as desired by the foot switch.
- Connect foot switch into FOOT SWITCH ECHO/OFF jack.
- Depress foot switch for on/off action.

ECHO DELAY CONTROL

- Longest echo "delay" achieved when pointer is at the highest number. Delay shortens as control pointer is moved towards "0".

PLAYBACK FEATURE

Only the Echoplex enables you to record and playback recorded material in accompaniment.

- Connect foot switch into PLAYBACK jack.
- Alternate switch button on pedal and you can rotate between recording and playback instantaneously.
- When RECORDING light glows, you are in "recording" position.
- Tape will play over and over until you switch foot pedal control.

ECHO CHAMBER EFFECTS FOR VOCALISTS

- Connect output of Echoplex into microphone amplifier.
- Connect microphone into Echoplex INPUT jack.
- Operate controls as previously explained for many unusual effects that can be secured as you master the Echoplex technique.

CARE OF THE ECHOPLEX

As is true on all tape recorders, it is necessary to clean tape heads, capstan and roller regularly for best results and achieve maximum echo/playback.

Loss of brilliance, echo repeats and playback depends upon the care of your Echoplex.

- Remove cover.
- Remove tape from between heads, guides and rollers.
- Use alcohol and cotton cue stick to swab parts.

CAUTION

Take care to avoid getting fluid on tape.

- Allow parts to dry a few seconds, then follow diagram on inside top cover to replace tape.
- Allow tape to run a few minutes to be sure that tape is positioned correctly before replacing cover.

TAPE CARTRIDGES

Tape cartridges are available at your dealer. Keep a spare with your Echoplex. Cartridges are easily installed if the replacement procedure contained in the spare tape cartridge carton is followed.

Maestro Echoplex EP-4

FEATURES

- Echo On/Off can be controlled with foot switch.
- Playback feature — record and playback in accompaniment.
- Special Effects — created by increasing the echo feedback with the sustain control.
- Exclusive Echoplex replaceable two minute tape cartridge included.
- Foot switch, cables and carrying case included.
- Wow and flutter less than 0.15%.
- 15 pounds total weight.
- 13 inches wide, 18-1/4 inches deep, 8-1/8 inches high.
- Operates on 110 volt, 60 cycle AC current.
- LED's to indicate RECORDING LEVEL.

USE OF THE ECHOPLEX

While retaining the time proven dependable mechanical features, additional electronics have been incorporated into this Echoplex to increase its versatility.

POWER SOURCE

CAUTION

The Echoplex may be damaged if connected to an incorrect power source.

- Connect to 105/125 volt, 60 cycle power source.
- Turn on RECORDING VOLUME control and allow five minute warmup period for cold condensation, that may exist, to disappear.
- If motor fails to start, slap sides of cabinet. This will realign bearings if unit has been roughly handled during shipment.
- Connect OUTPUT jack into INPUT jack of amplifier.
- Connect instrument into INPUT jack of Echoplex.

NOTE

OUTPUT jacks are located in the compartment area. The forward jack is for musical instrument amplifiers. The jack is a high level, emitter follower output, for use with high or low impedence PA mixer panels.

RECORD LEVEL ADJUSTMENT

The Echoplex contains new circuitry to reduce "hiss" and distortion. For best results, adjust the record level as follows:

- A RECORDING LEVEL indicator is provided to monitor the sound as it is being recorded on tape.
- During the performance, advance the RECORDING VOLUME control so that as the louder peaks are played, the green indicator will be active.
- If yellow is indicated, then too little volume is being recorded on tape. Turn up amplifier volume to the point where tape "hiss" is objectionable.
- Echoplex is better than 50dB, and if recordings are made at the proper level, tape "hiss" will not be objectionable.
- Indication on the red area is too high, and may cause distortion.

ECHO VOLUME CONTROL

For balancing between instrument and echo sound.

- Turn ECHO/REPEATS control to "1".
- Turn VOLUME (mixer) Instrument/Echo control to full counterclockwise.
- Pluck one string and you will hear straight through sound.
- Keep plucking string and slowly turn VOLUME control clockwise and you will hear an echo sound introduced into the guitar original sound.
- Slowly continue to turn VOLUME control clockwise and you will hear an increase in echo volume and a decrease in straight through sound and finally you will hear only the recorded, or echo sound.

ECHO SUSTAIN CONTROL

To increase number of echoes following the sound through.

- To select desired number of echo repeats, mute the guitar strings . . . staccato . . . so as to make a short sound.
- Slowly turn ECHO SUSTAIN control clockwise and you will hear the number of echo repeats increasing to the point where they take over and "run away" or feed back.

NOTE

This EXTRA POWER is there only to compensate when tape heads become worn or cleaning has been neglected.

- In your setting of the ECHO SUSTAIN control, when you come to the "run away", back off, and turn control counterclockwise until the "run away" is corrected.

ECHO ON/OFF CONTROL

- Provided to turn echo on/off as desired by the foot switch.
- Connect foot switch into ECHO/OFF jack.
- Depress foot switch for on/off action.

ECHO DELAY CONTROL

- Longest echo delay achieved when pointer is at LONG. Delay shortens as control is moved towards SHORT.

ECHO TONE CONTROL

Separate BASS and TREBLE tone controls to create special tonal effects with the echo sound.

- Center position of both controls is normal tone.
- Turning either control will either add or subtract in that tonal range and affects only the playback of the echo, and does not affect the sound as it is being recorded.

PLAYBACK FEATURE

Only the Echoplex enables you to record and playback recorded material in accompaniment.

- Connect foot switch into PLAYBACK jack.
- Alternate switch button on pedal and you can rotate between recording and playback instantaneously.
- When RECORDING light glows, you are in "recording" position.
- Tape will play over and over until you switch foot pedal control.

ECHO CHAMBER EFFECTS FOR VOCALISTS

- Connect output of Echoplex into microphone amplifier.
- Connect microphone into Echoplex INPUT jack.
- Operate controls as previously explained for many unusual effects that can be secured as you master the Echoplex technique.

CARE OF THE ECHOPLEX

As is true on all tape recorders, it is necessary to clean tape heads, capstan and roller regularly for best results and achieve maximum echo/playback. Loss of brilliance, echo repeats and playback depends upon the care of your Echoplex.

- Remove cover.
- Remove tape from between heads, guides and rollers.
- Use alcohol and cotton cue stick to swab parts.

CAUTION
Take care to avoid getting fluid on tape.

- Allow parts to dry a few seconds, then follow diagram on inside top cover to replace tape.
- Allow tape to run a few minutes to be sure that tape is positioned correctly before replacing cover.

TAPE CARTRIDGES

Tape cartridges are available at your dealer. Keep a spare with your Echoplex. Cartridges are easily installed if the replacement procedure contained in the spare tape cartridge carton is followed.

Maestro Sireko ES-1

FEATURES

- Echo On/Off can be controlled with foot switch.
- Special Effects created by increasing the echo feedback with the sustain control.
- Foot switch, cables and carrying case included.
- Wow and flutter less than .3%.
- 14-1/2 inches wide, 7-1/2 inches deep, 6-3/4 inches high.
- Operates on 110 volt, 60 cycle AC current.

POWER SOURCE

CAUTION
The Sireko may be damaged if connected to an incorrect power source.

- Connect to 105/125 volt, 60 cycle power source.

- Turn on ECHO SUSTAIN control and allow five minute warmup period to allow for cold condensation, that may exist, to disappear.

- If motor fails to start, slap sides of cabinet. This will realign bearings if unit has been roughly handled during shipment.

- Connect OUTPUT jack into INPUT jack of amplifier.

- Connect instrument into INPUT jack of Sireko.

RECORD LEVEL ADJUSTMENT

- Remove round plug marked RECORD LEVEL and turn slotted screw inside to match output of your guitar.

NOTE

This adjustment is very necessary. If the volume setting is too low a weak recording will occur, resulting in a poor signal-to-noise ratio. This low recording level would force you to turn up the amplifier volume level to a level that would cause tape "hiss". However, a high output guitar must be compensated for because it may cause an overloaded and distorted recording.

Adjustment procedures are as follows:

- Turn ECHO SUSTAIN control to "1".

- Turn ECHO VOLUME control clockwise. In this position you will hear only what is recorded.

- Strum strings of guitar as you normally play.

- If distortion occurs, slowly turn RECORD LEVEL adjustment screw counterclockwise until distortion disappears.

- If echo is weak, slowly turn RECORD LEVEL adjustment screw clockwise until guitar tones are strong and without distortion.

- One adjustment properly made should suffice as long as the same instrument is used.

ECHO VOLUME CONTROL

For balancing between instrument and echo sound.

- Turn ECHO/REPEATS control to "1".

- Turn VOLUME (mixer) Instrument/Echo control to full counterclockwise.

- Pluck one string and you will hear straight through sound.

- Keep plucking string and slowly turn VOLUME control clockwise and you will hear an echo sound introduced into the guitar original sound.

- Slowly continue to turn VOLUME control clockwise and you will hear an increase in echo volume and a decrease in straight through sound and finally, you will hear only the recorded, or echo sound.

ECHO SUSTAIN

To increase number of echoes following the sound through.

- To select desired number of echo repeats, mute the guitar strings . . . staccato . . . so as to make a short sound.

- Slowly turn ECHO SUSTAIN control clockwise and you will hear the number of echo repeats increasing to the point where they take over and "run away" or feed back.

NOTE

This EXTRA POWER is there only to compensate when tape heads become worn or cleaning has been neglected.

- In your setting of the ECHO SUSTAIN control, when you come to the "run away", back off and turn control counterclockwise until the "run away" is corrected.

ECHO ON/OFF CONTROL

- Provided to turn echo on/off, as desired, by the foot switch.

- Connect foot switch into FOOT SWITCH ECHO ON/OFF jack.

- Depress foot switch for on/off action.

ECHO DELAY CONTROL

- Longest echo delay achieved when pointer is at LONG. Delay shortens as control is moved towards SHORT.

ECHO CHAMBER EFFECTS FOR VOCALISTS

- Connect output of Sireko into microphone amplifier.

- Connect microphone into Sireko jack.

- Operate controls as previously explained for many unusual effects that can be secured as you master the Sireko technique. Reset RECORD LEVEL higher for a microphone.

CARE OF THE SIREKO

As is true on all tape recorders, it is necessary to clean tape heads, capstan and rollers regularly for best results and achieve maximum echo/playback. Loss of brillance, echo repeats and playback depends upon the care of your Sireko.

- Remove cover.

- Remove tape from between heads, guides and rollers.

- Use alcohol and cotton cue stick to swab parts.

CAUTION

Take care to avoid getting fluid on tape.

- Allow parts to dry a few seconds, then follow diagram on inside top cover to replace tape.

- Allow tape to run a few minutes to be sure that tape is positioned correctly before replacing cover.

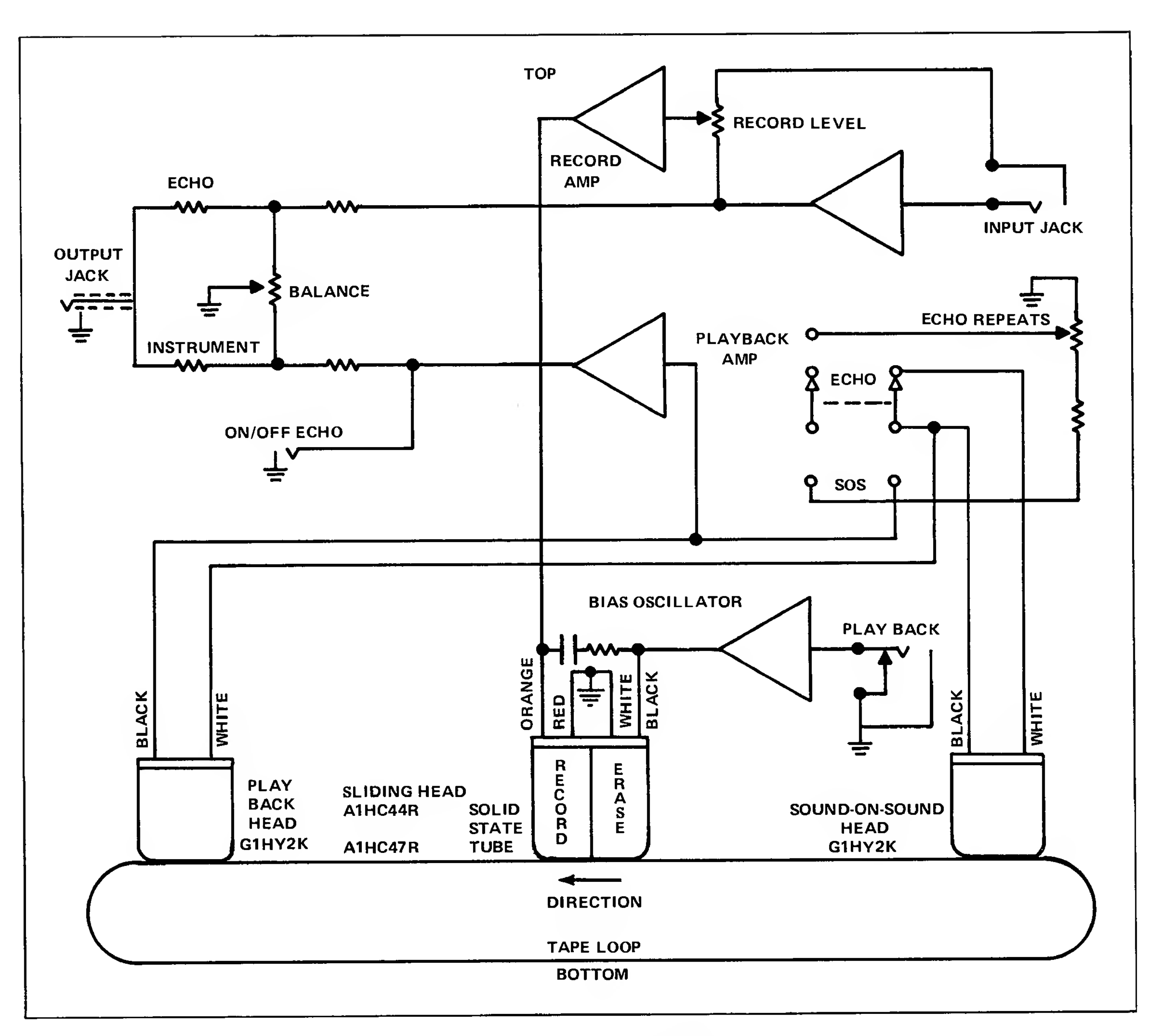
TAPE CARTRIDGES

Tape cartridges are available at your dealer. Keep a spare with your Sireko. Cartridges are easily installed if the replacement procedure contained in the spare tape cartridge carton is followed.

Service Information

CONTENTS

LIST OF ILLUSTRATIONS



FUNCTIONAL BLOCK DIAGRAM
OF ECHOPLEX AND GROUPMASTER UNIT

EQUIPMENT REQUIRED

Oscilloscope, Audio Signal Generator and VU Meter or AC Voltmeter.

CONTROL SETTING

Set ECHO VOLUME to MAXIMUM, ECHO SUSTAIN to MINIMUM and ECHO DELAY to MAXIMUM.

BRIDGE ALIGNMENT

Loosen screws holding bridge, and tighten them while spacing bridge approximately 1/8 inch from cover studs located near each end of bridge.

HEAD ALIGNMENT

a) Using your eyesight as your judge, adjust the sliding record/erase head until it is level, and the tape passes the head evenly and smoothly.

b) Make sure tape is flat against the head. Move slider across bridge and observe that tape height on playback head does not change. If tape height does change, place a thin washer under the low side of the bridge to level it.

PLAYBACK HEAD
(Left Head, Looking At Front Of Machine)

a) Set signal generator to 1000Hz sine wave and connect to INPUT jack. Set ECHO DELAY to MAXIMUM.

b) Using needle nose pliers, gently bend playback head mounting bracket up and down until the maximum sine wave is obtained. Use caution not to break metal bracket loose from bridge. Move slider across and observe level change ± 3dB. If out of specification, repeat step b with ECHO DELAY at MINIMUM.

c) Using trimmer potentiometer adjusting tool, turn trimmer potentiometer on the oscillator board until maximum sine wave is obtained with ECHO DELAY at MAXIMUM.

d) Set signal generator to 6000Hz.

e) Using pliers, turn head horizontally (clockwise or counterclockwise) until maximum wave is obtained.

f) Slide record head along bridge, stopping at each numbered delay position observing oscilloscope that the 6000Hz wave holds maximum heights as much as possible. Make any readjustments needed if wave drops considerably. Slide head next to playback head and check wave. This is necessary for echoing effect.

g) Return signal generator to 100Hz. Turn ECHO SUSTAIN control to position "1". Turn ECHO VOLUME control to position "9". Using small screwdriver, adjust record level by matching sine waves on ECHO VOLUME control in positions "1" and "9".

h) Remove input plug enough to stop incoming signal.

i) Turn ECHO VOLUME to position "6", "7" or "8". Turn ECHO SUSTAIN control to approximately "6" or "7".

j) Quickly push and pull input in far enough to record a signal and pull plug out, and listen or watch for the echoing effect. If unit is set and aligned properly, there should not be any problems. If echo begins, but fades away, turn ECHO SUSTAIN to a higher position, "7" or "8".

k) Slide record head away from present position and test for echo once again.

SOUND ON SOUND HEAD ALIGNMENT

a) Record approximately one minute of 100Hz, no echoing, and approximately one minute of 6000 Hz, no echoing. Connect VU meter to unused connection terminal on record board, next to orange voltage wire. Set VU meter to 100 percent.

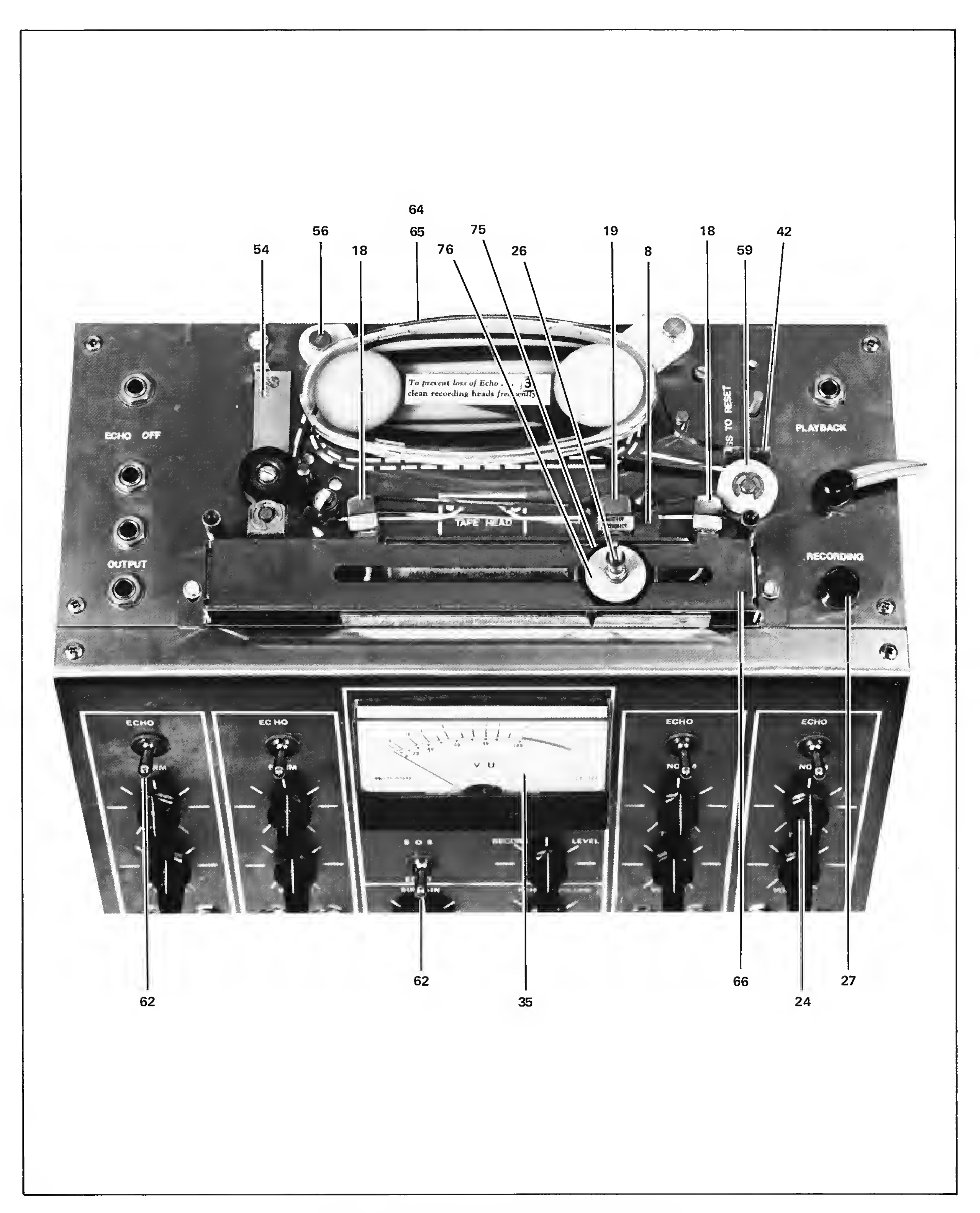
b) Place foot switch in PLAYBACK jack, and shut off when record time is complete.

c) Adjust sound on sound head same as playback, and flip ECHO SOUND ON SOUND switch until both heads produce approximately the same wave amplitude on both frequencies.

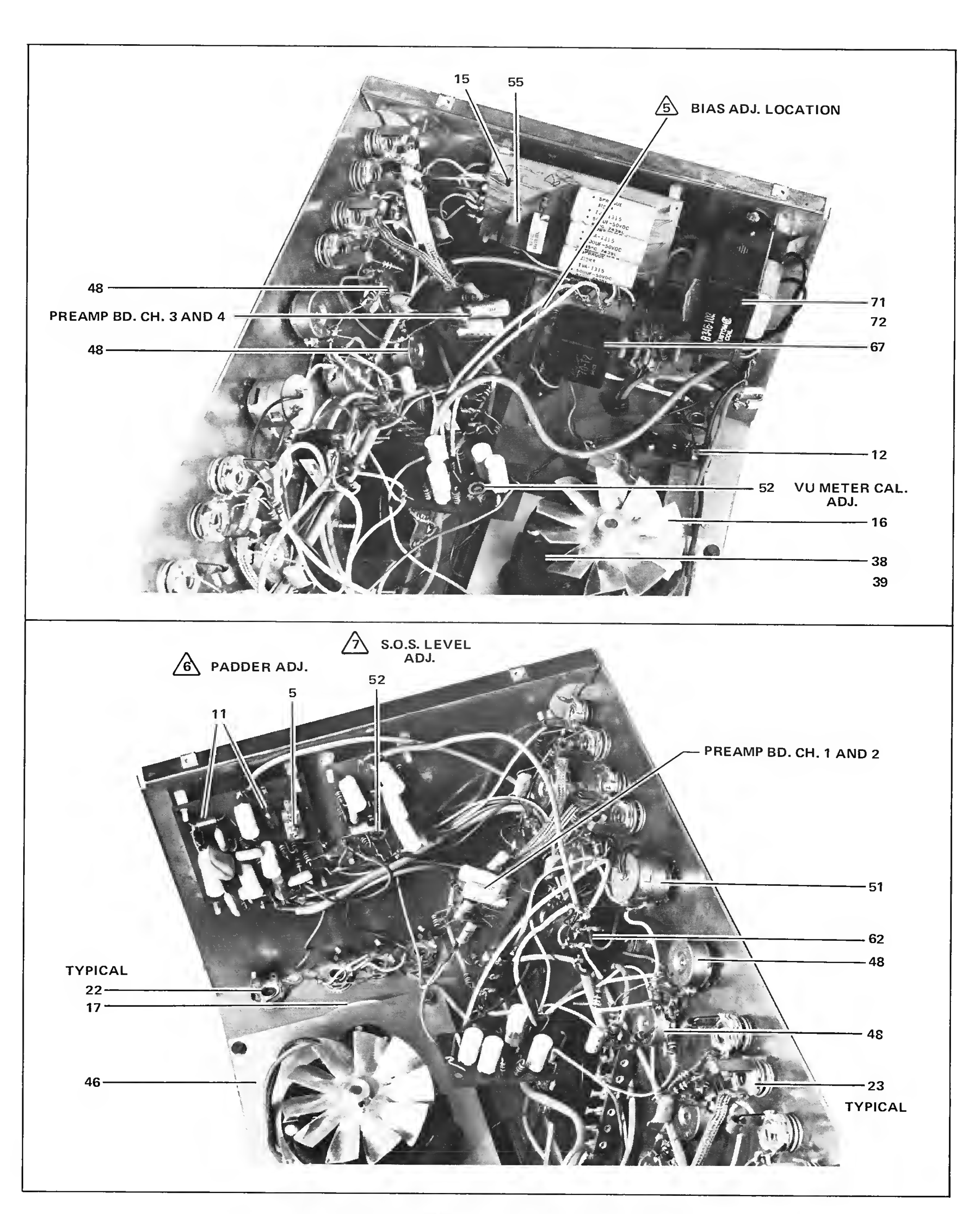
d) Turn foot switch on. During 1000Hz playback, with switch in SOUND ON SOUND position, adjust trimmer potentiometer on playback board until VU meter reads 95 percent.

e) Each time the 1000Hz passes, the VU meter should drop approximately 1dB. If VU meter does not drop 1dB, turn the trimmer potentiometer a little more until the desired results are obtained.

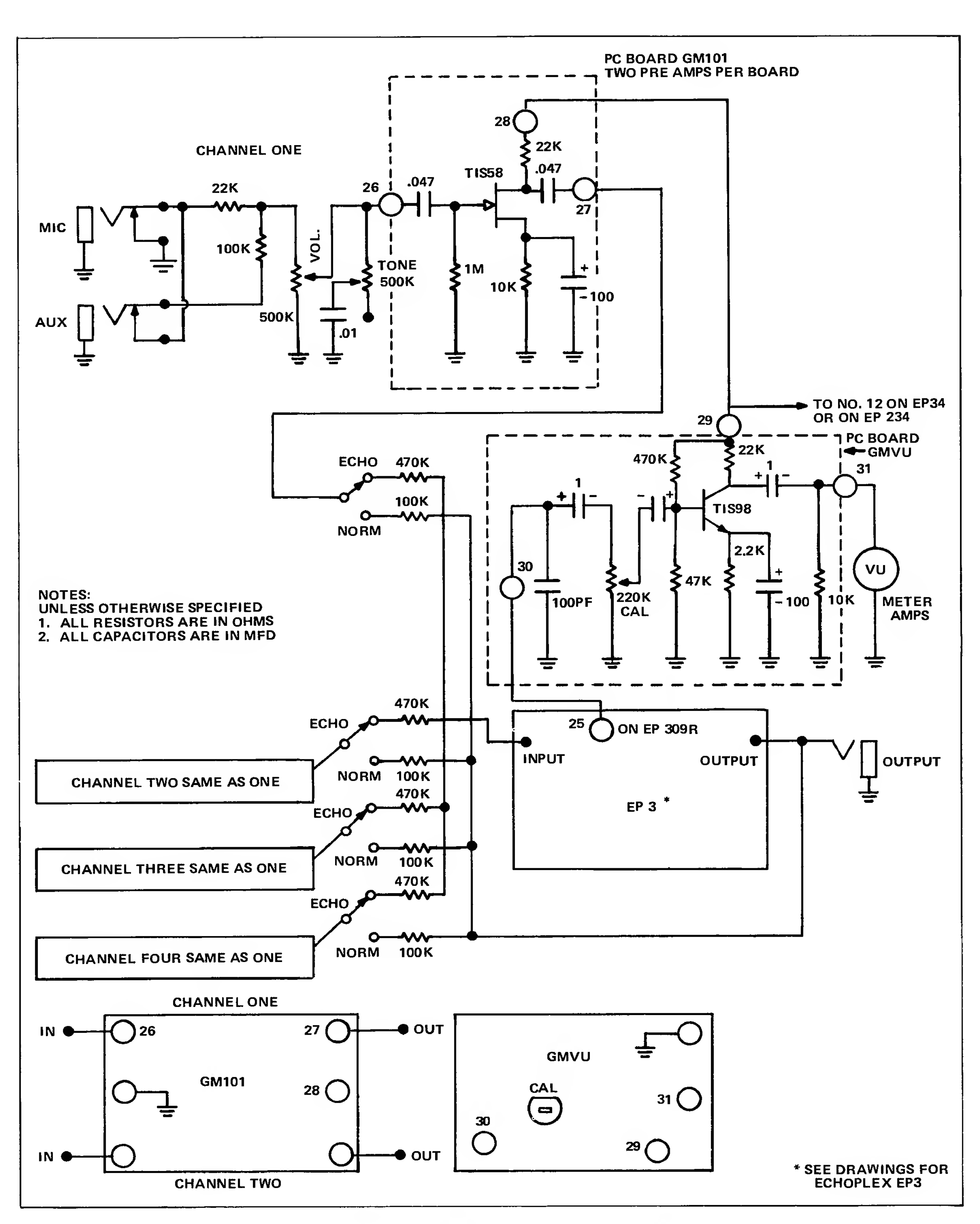
f) Glue heads in this position to maintain setup.



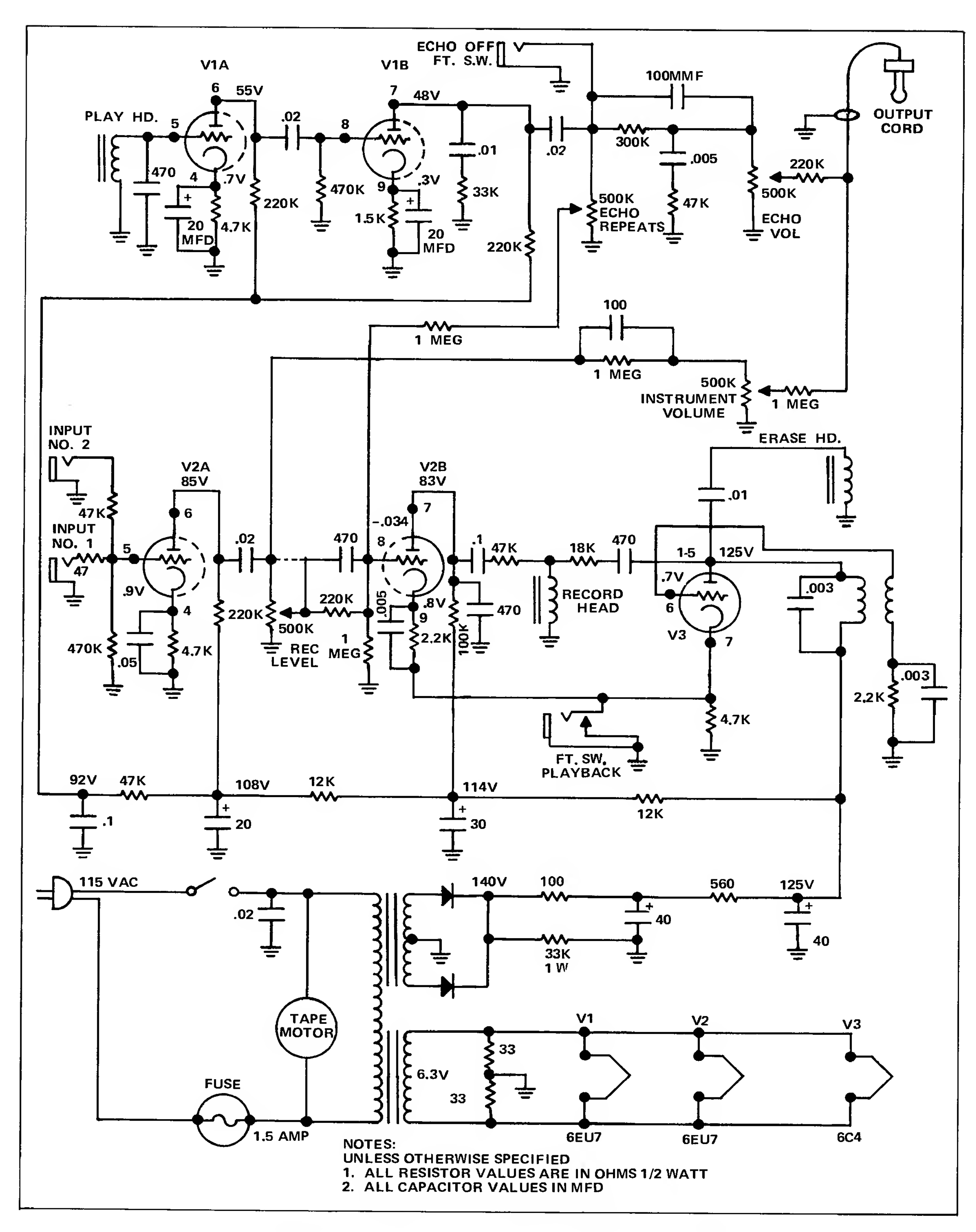
GROUPMASTER EM-1, FRONT AND TOP VIEW



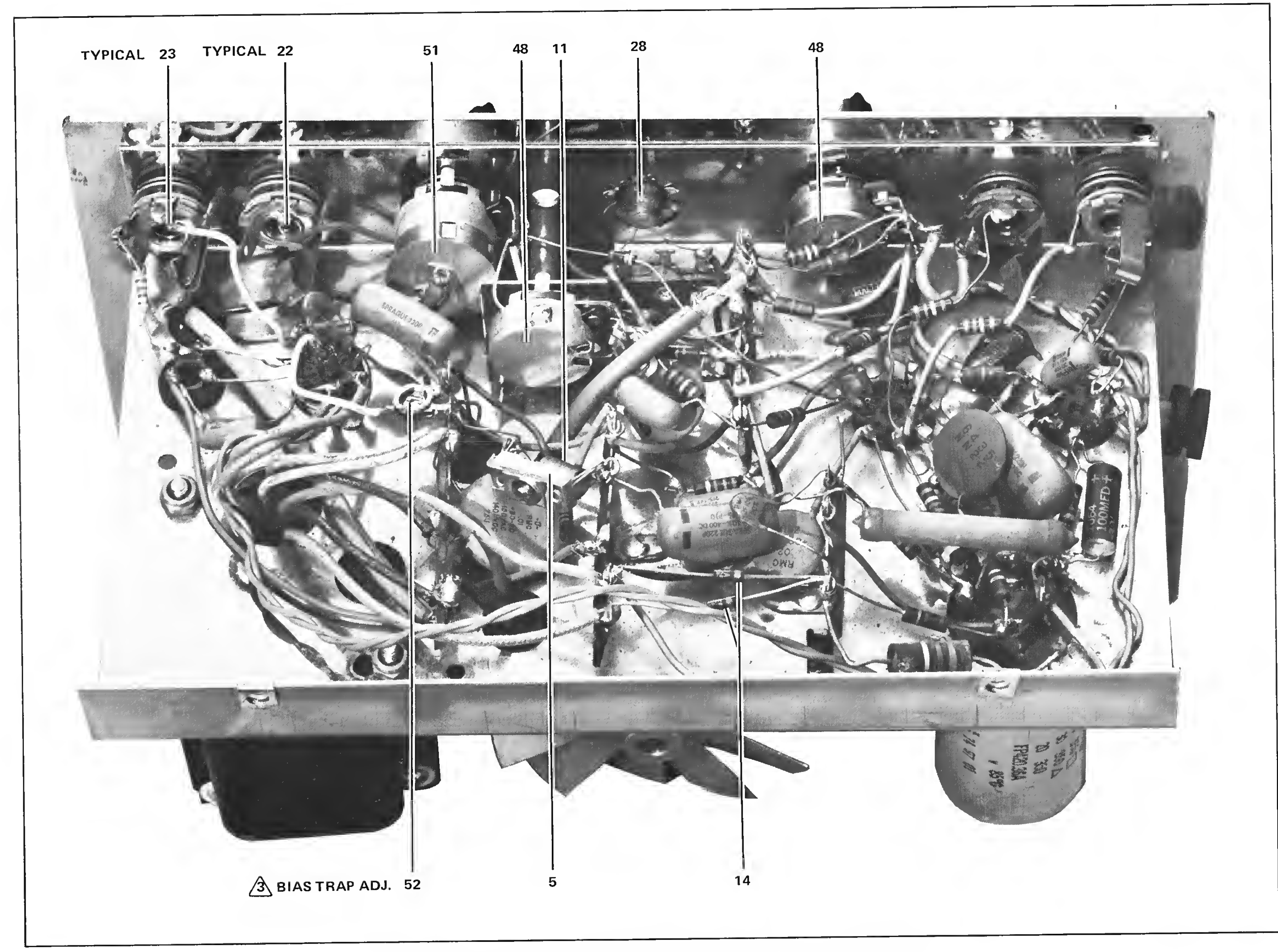
GROUPMASTER EM-1, INSIDE COMPONENT VIEWS



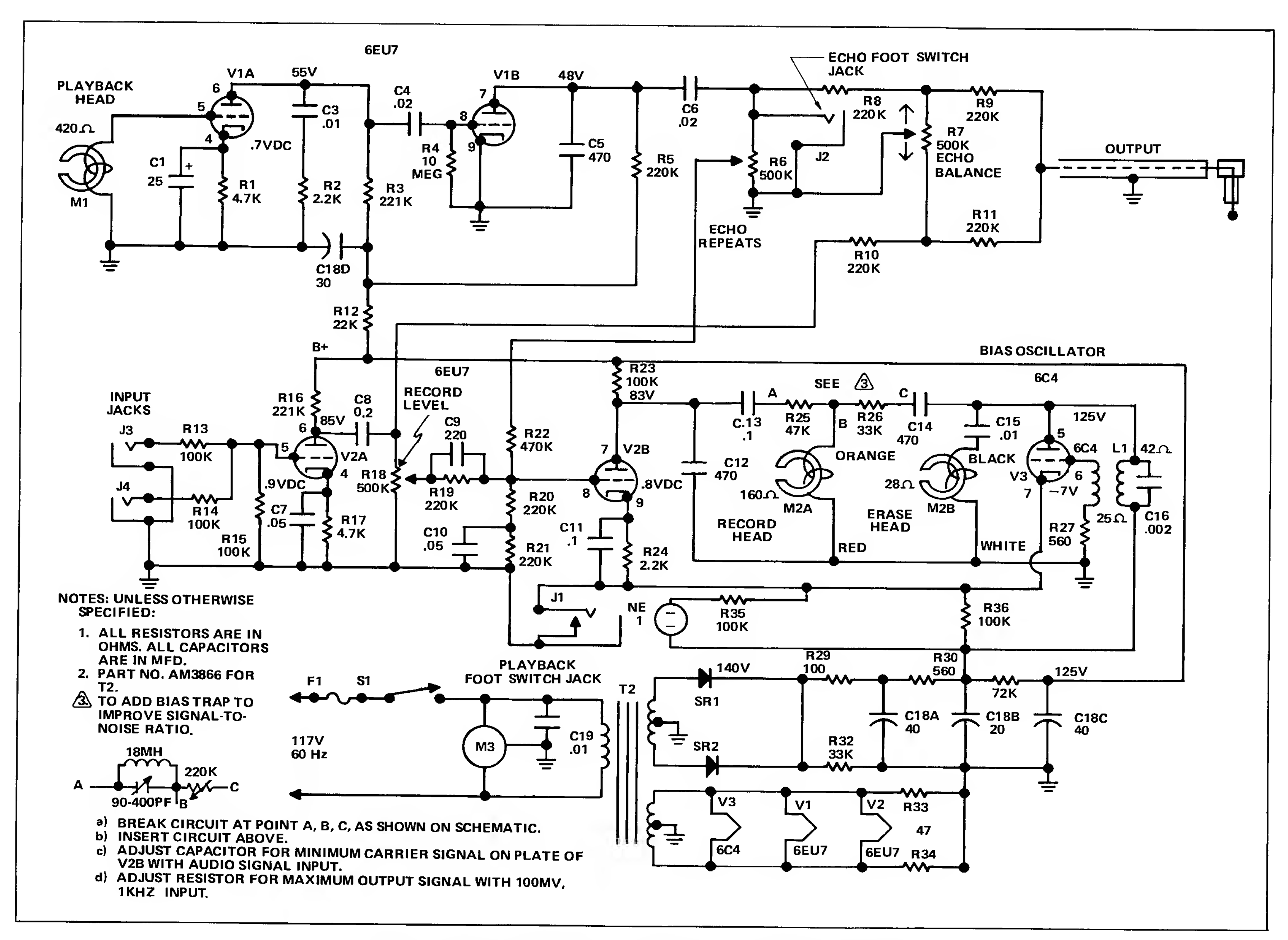
GROUPMASTER EM-1 SCHEMATIC DIAGRAM



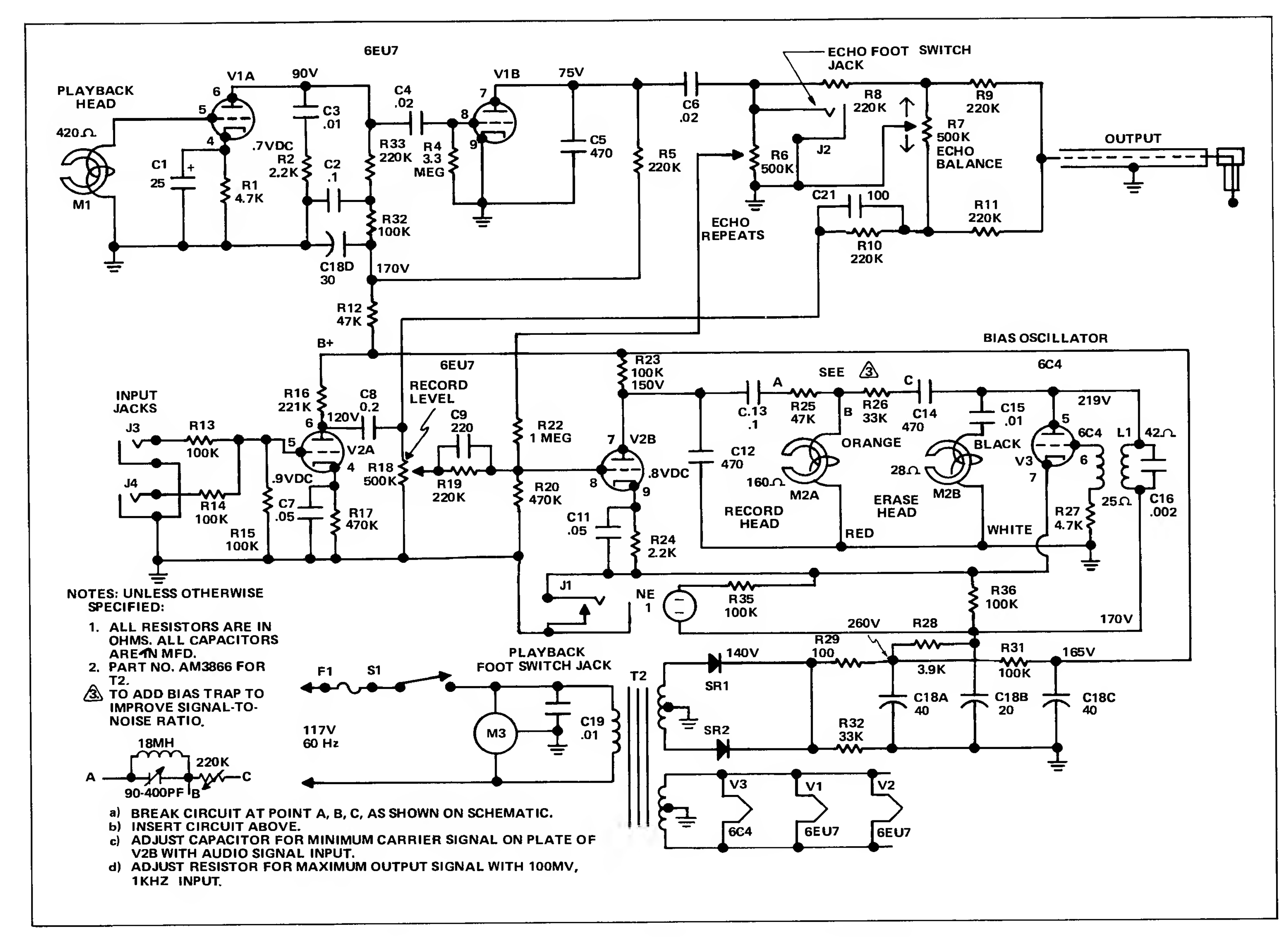
ECHOPLEX EP-1 MODEL NO. 5000 SCHEMATIC DIAGRAM



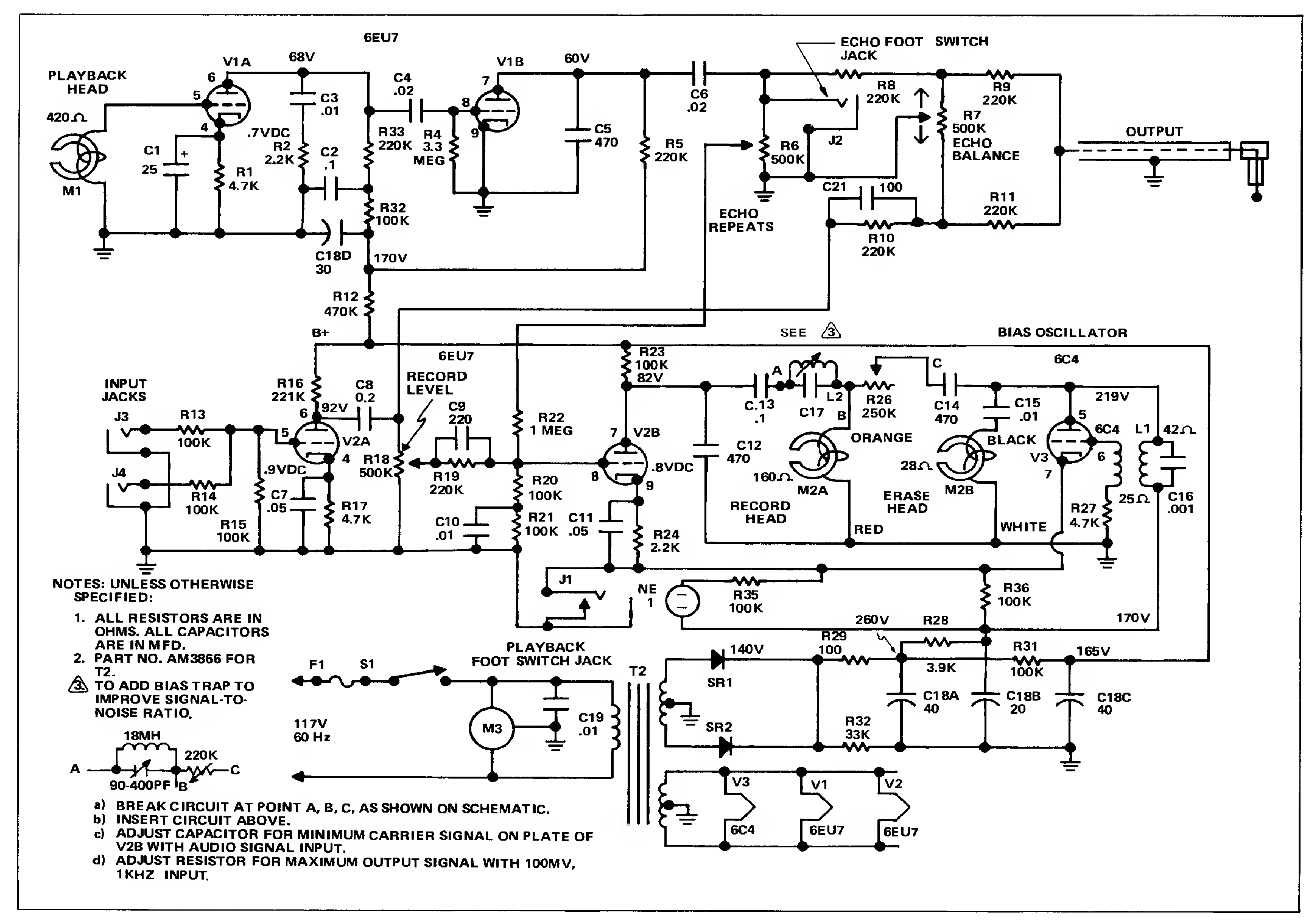
ECHOPLEX EP-1 AND EP-2, INSIDE BOTTOM COMPONENT VIEW



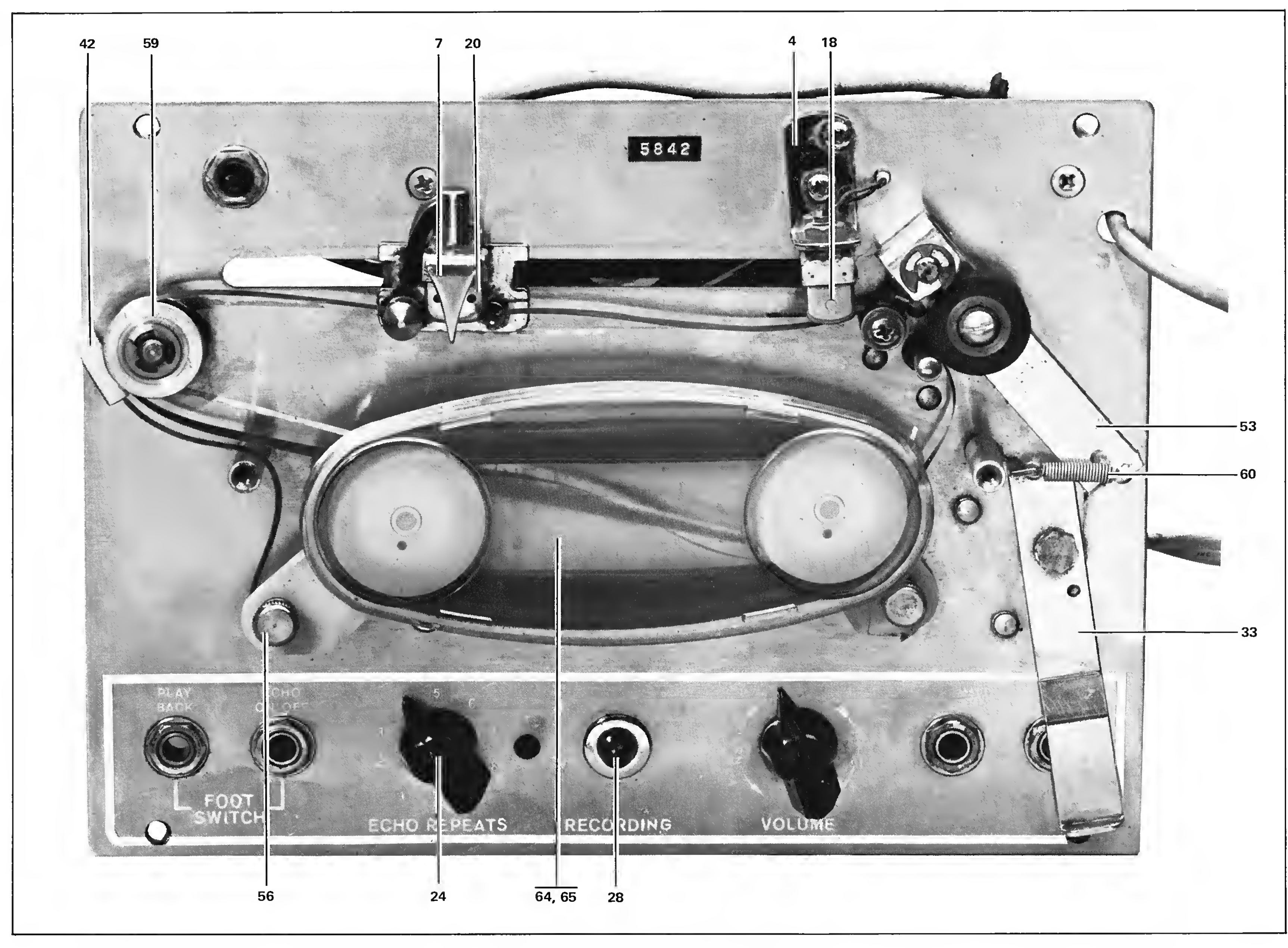
ECHOPLEX EP-2 SCHEMATIC DIAGRAM - SERIAL NO. 1549 TO 2749



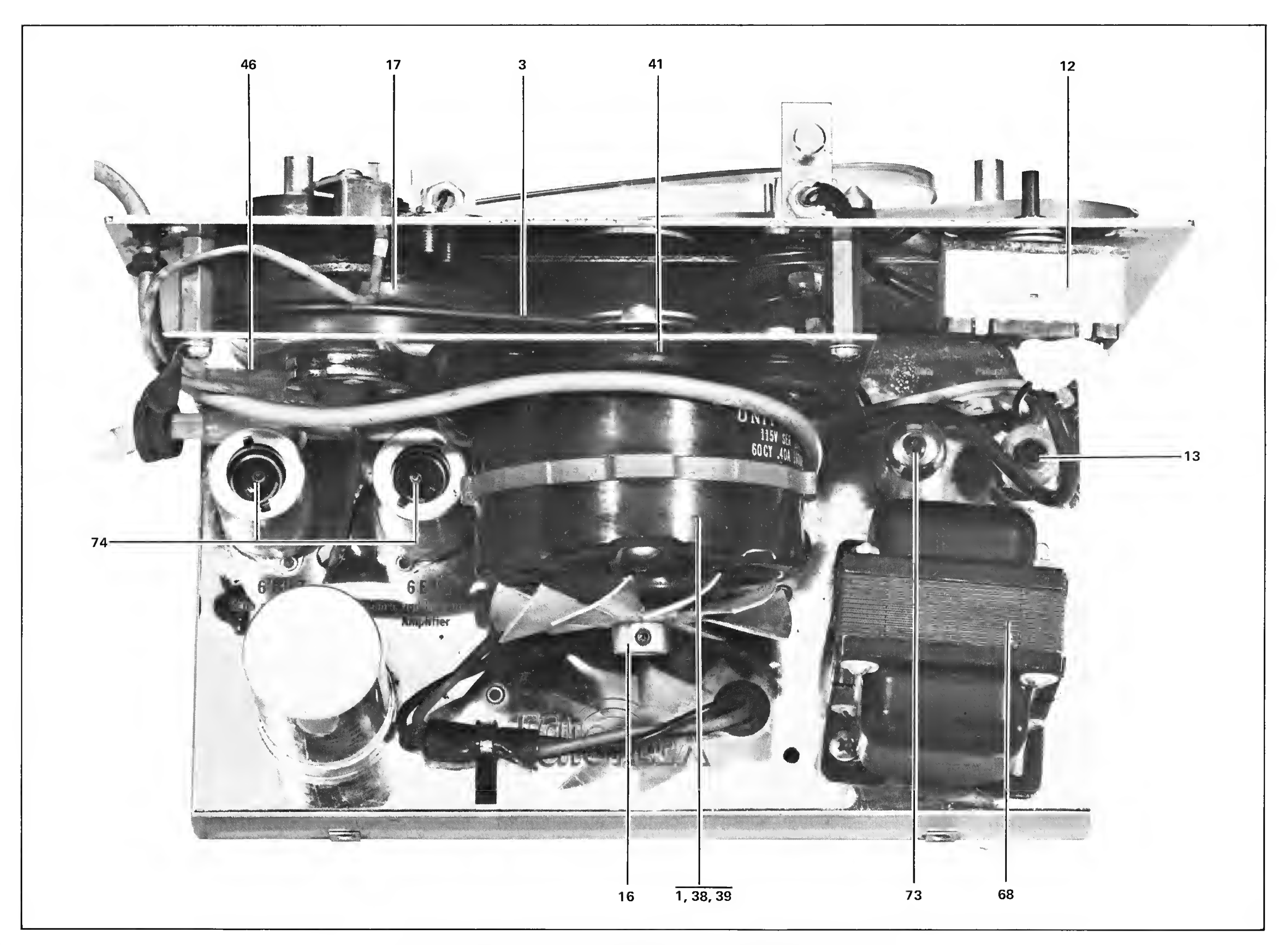
ECHOPLEX EP-2 SCHEMATIC DIAGRAM – SERIAL NO. 2750 TO 5499



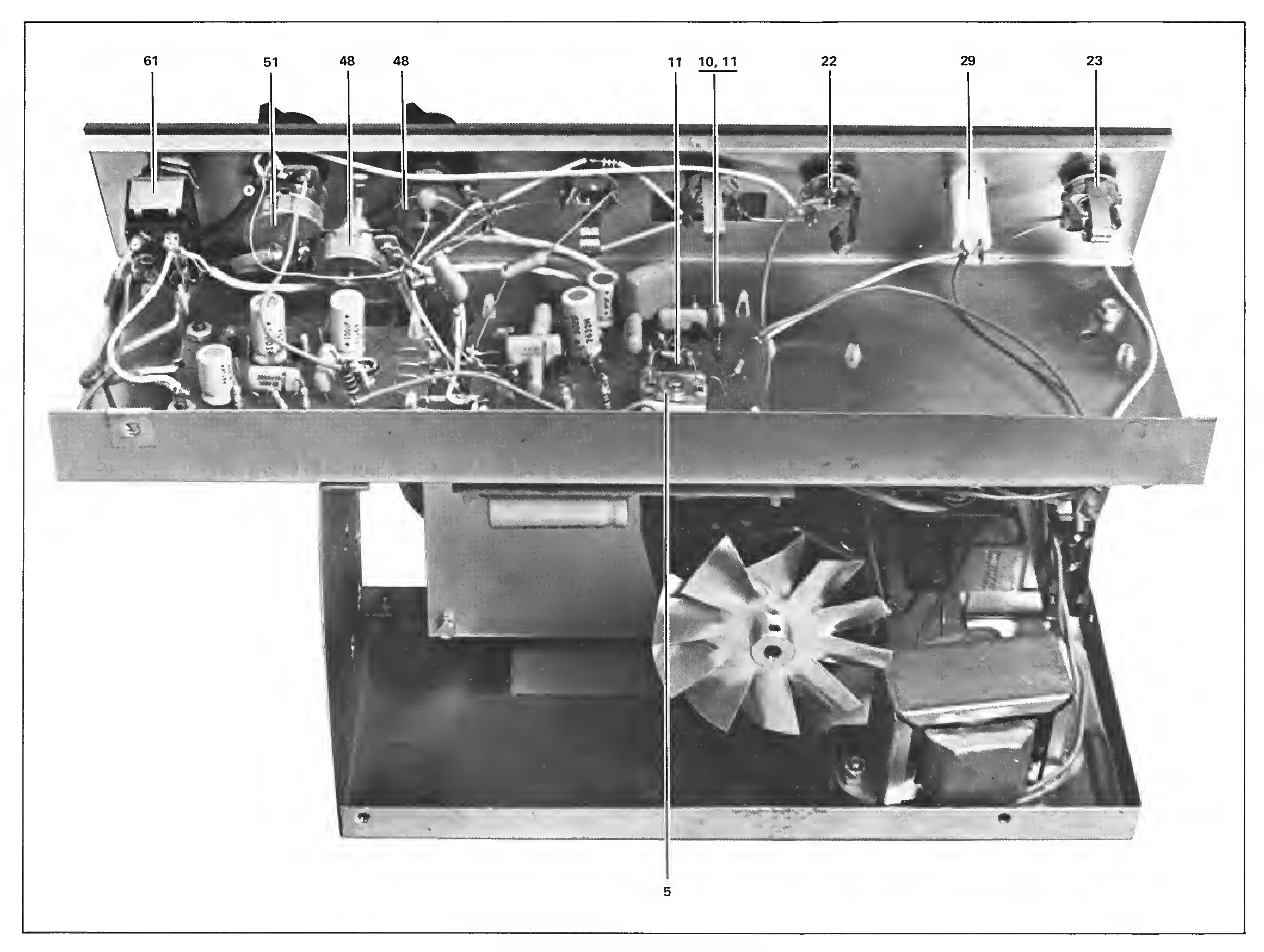
ECHOPLEX EP-2 SCHEMATIC DIAGRAM – SERIAL NO. 5500 TO 5938



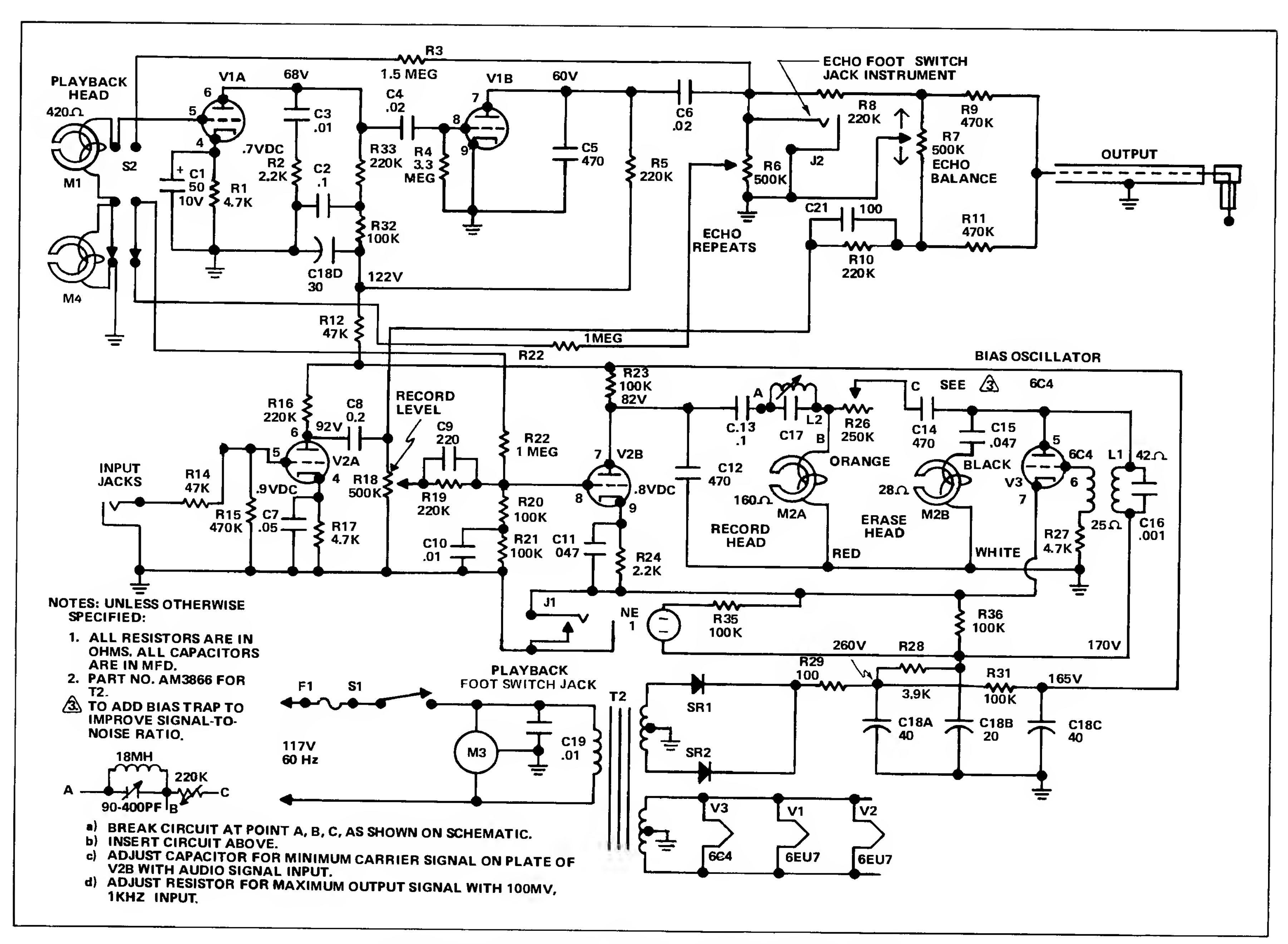
ECHOPLEX EP-1 AND EP-2, TOP VIEW



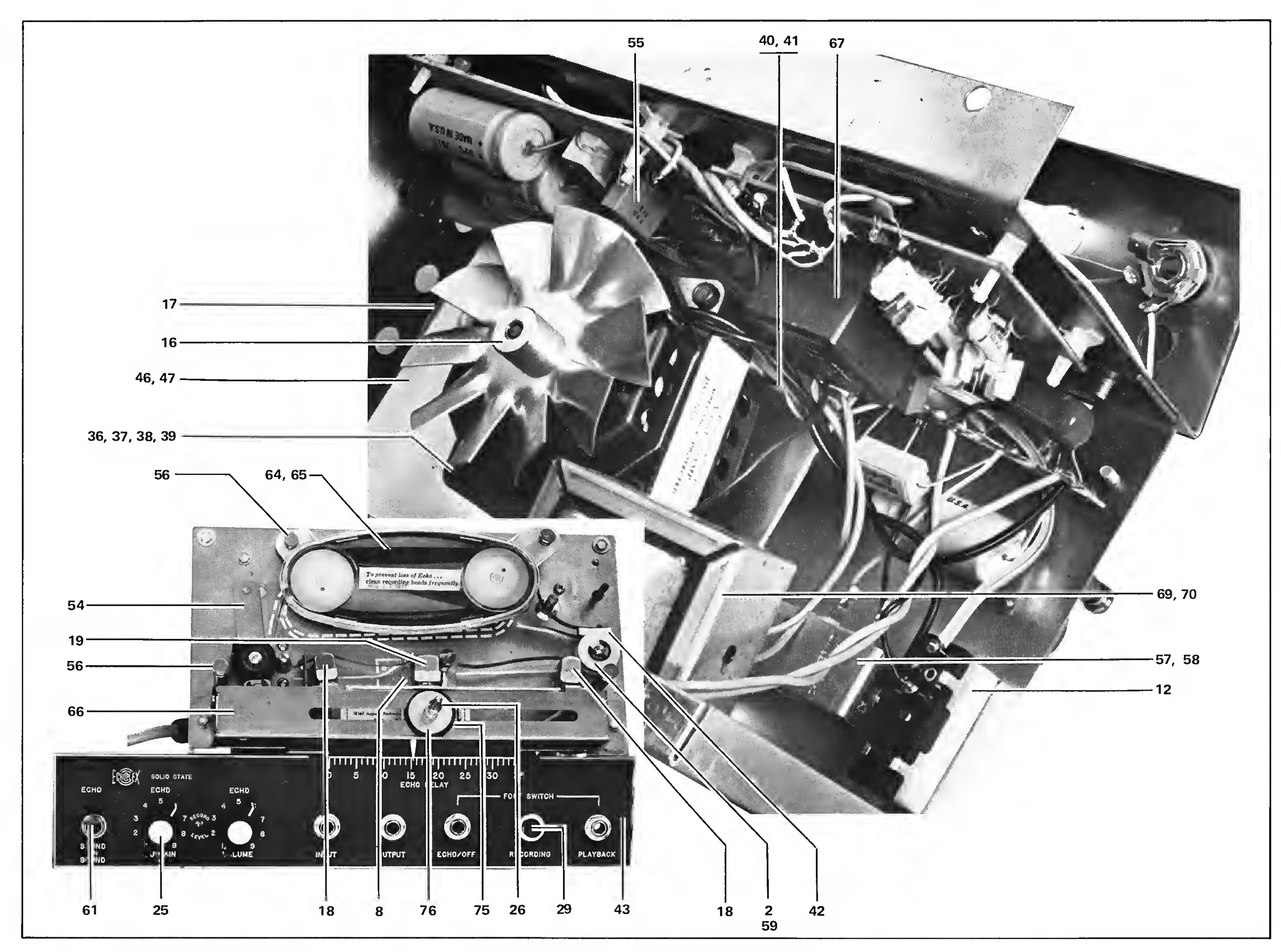
ECHOPLEX EP-1 AND EP-2, INSIDE TOP COMPONENT VIEW



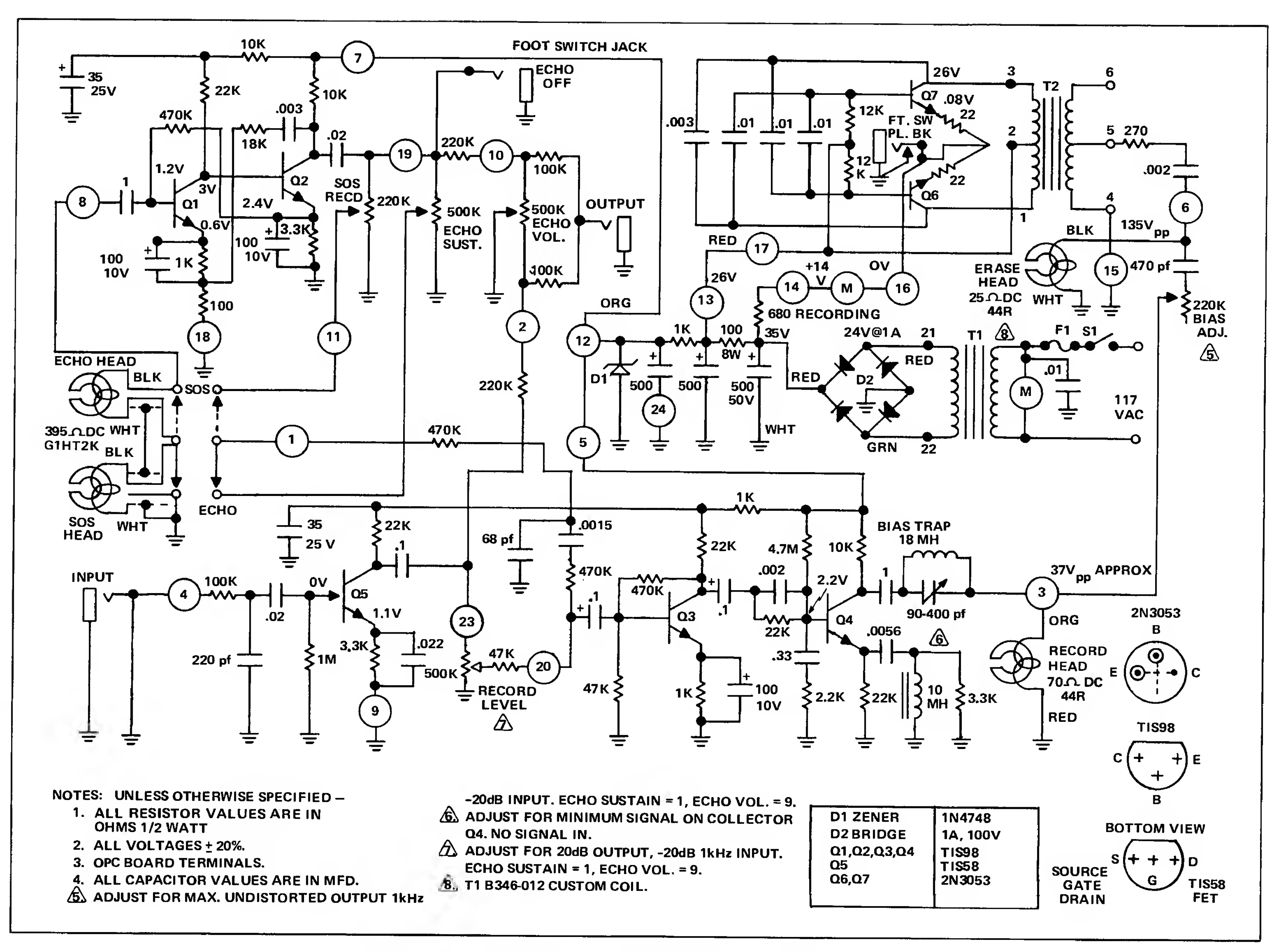
ECHOPLEX EP-3, INSIDE VIEW



ECHOPLEX EP-2 SCHEMATIC DIAGRAM - SERIAL NO. 5939 TO 9067



ECHOPLEX EP-3, TOP AND INSIDE VIEWS

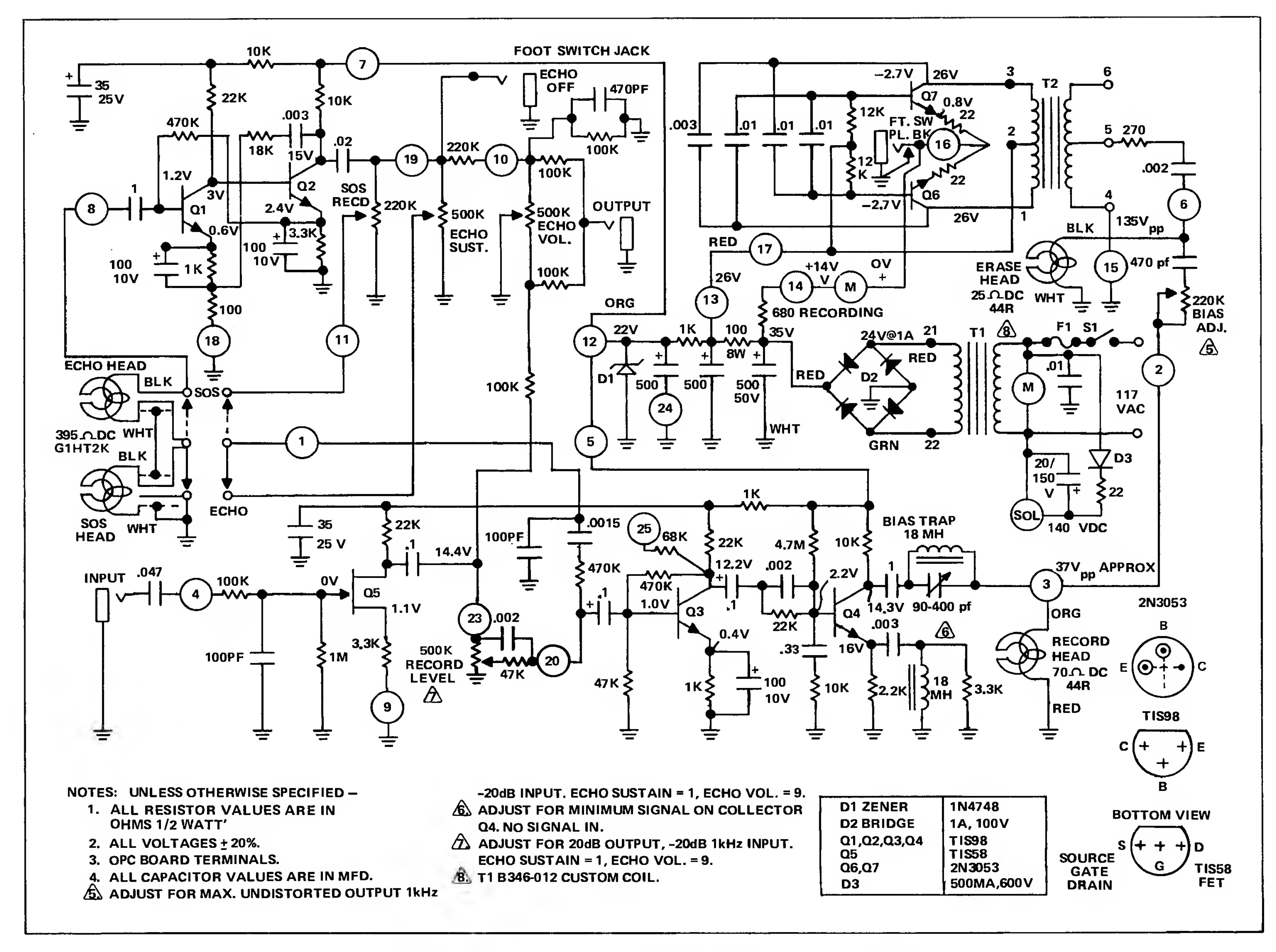


NOTES: UNLESS OTHERWISE SPECIFIED –

1. ALL RESISTOR VALUES ARE IN OHMS 1/2 WATT
2. ALL VOLTAGES ± 20%.
3. OPC BOARD TERMINALS.
4. ALL CAPACITOR VALUES ARE IN MFD.
5. ADJUST FOR MAX. UNDISTORTED OUTPUT 1kHz -20dB INPUT. ECHO SUSTAIN = 1, ECHO VOL. = 9.
6. ADJUST FOR MINIMUM SIGNAL ON COLLECTOR Q4. NO SIGNAL IN.
7. ADJUST FOR 20dB OUTPUT, -20dB 1kHz INPUT. ECHO SUSTAIN = 1, ECHO VOL. = 9.
8. T1 B346-012 CUSTOM COIL.

D1 ZENER	1N4748
D2 BRIDGE	1A, 100V
Q1,Q2,Q3,Q4	TIS98
Q5	TIS58
Q6,Q7	2N3053

ECHOPLEX EP-3 SCHEMATIC DIAGRAM - SERIAL NO. 9068 TO 9450

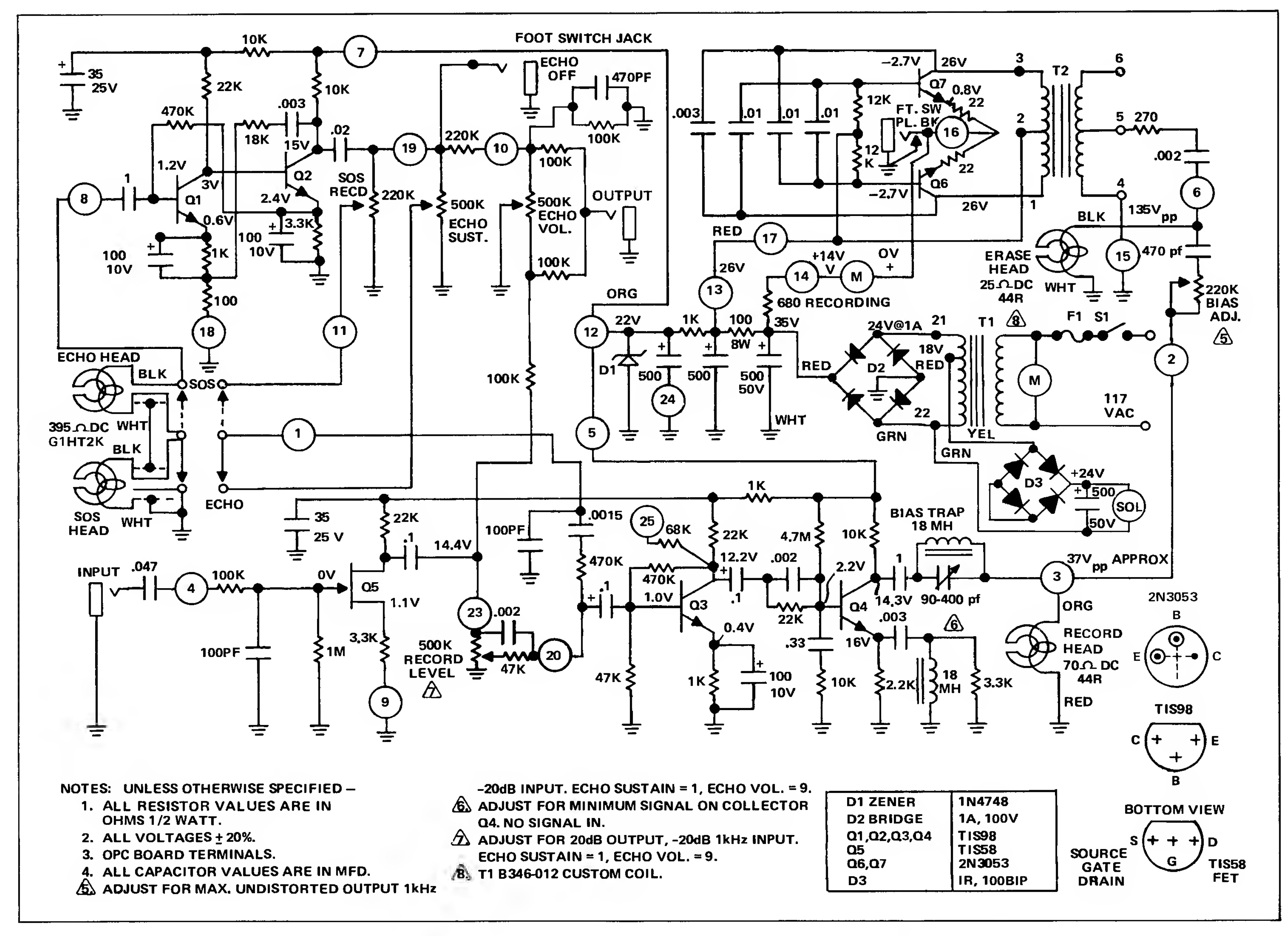


NOTES: UNLESS OTHERWISE SPECIFIED –

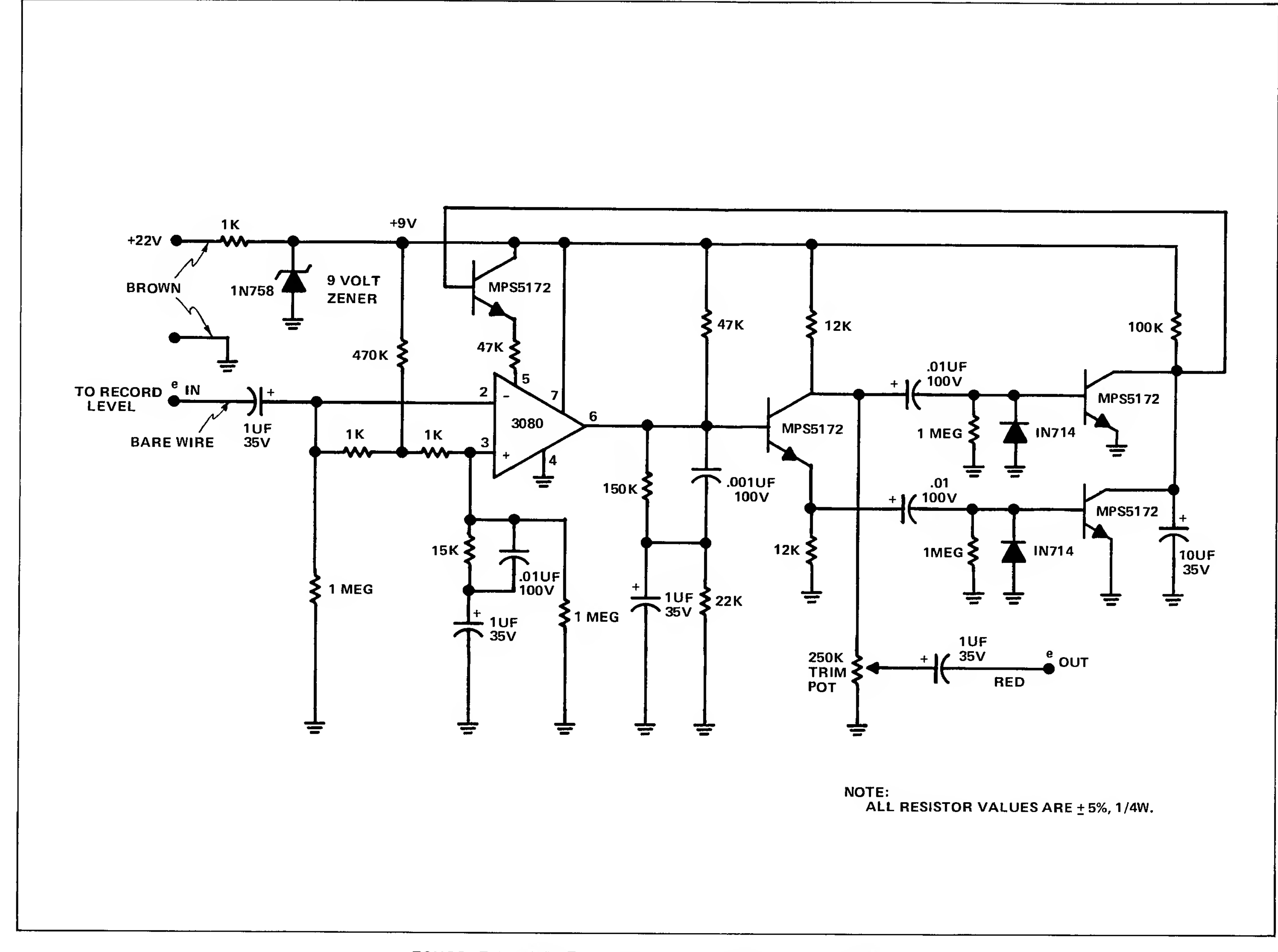
1. ALL RESISTOR VALUES ARE IN OHMS 1/2 WATT'
2. ALL VOLTAGES ± 20%.
3. OPC BOARD TERMINALS.
4. ALL CAPACITOR VALUES ARE IN MFD.
5. ADJUST FOR MAX. UNDISTORTED OUTPUT 1kHz -20dB INPUT. ECHO SUSTAIN = 1, ECHO VOL. = 9.
6. ADJUST FOR MINIMUM SIGNAL ON COLLECTOR Q4. NO SIGNAL IN.
7. ADJUST FOR 20dB OUTPUT, -20dB 1kHz INPUT. ECHO SUSTAIN = 1, ECHO VOL. = 9.
8. T1 B346-012 CUSTOM COIL.

D1 ZENER	1N4748
D2 BRIDGE	1A, 100V
Q1,Q2,Q3,Q4	TIS98
Q5	TIS58
Q6,Q7	2N3053
D3	500MA,600V

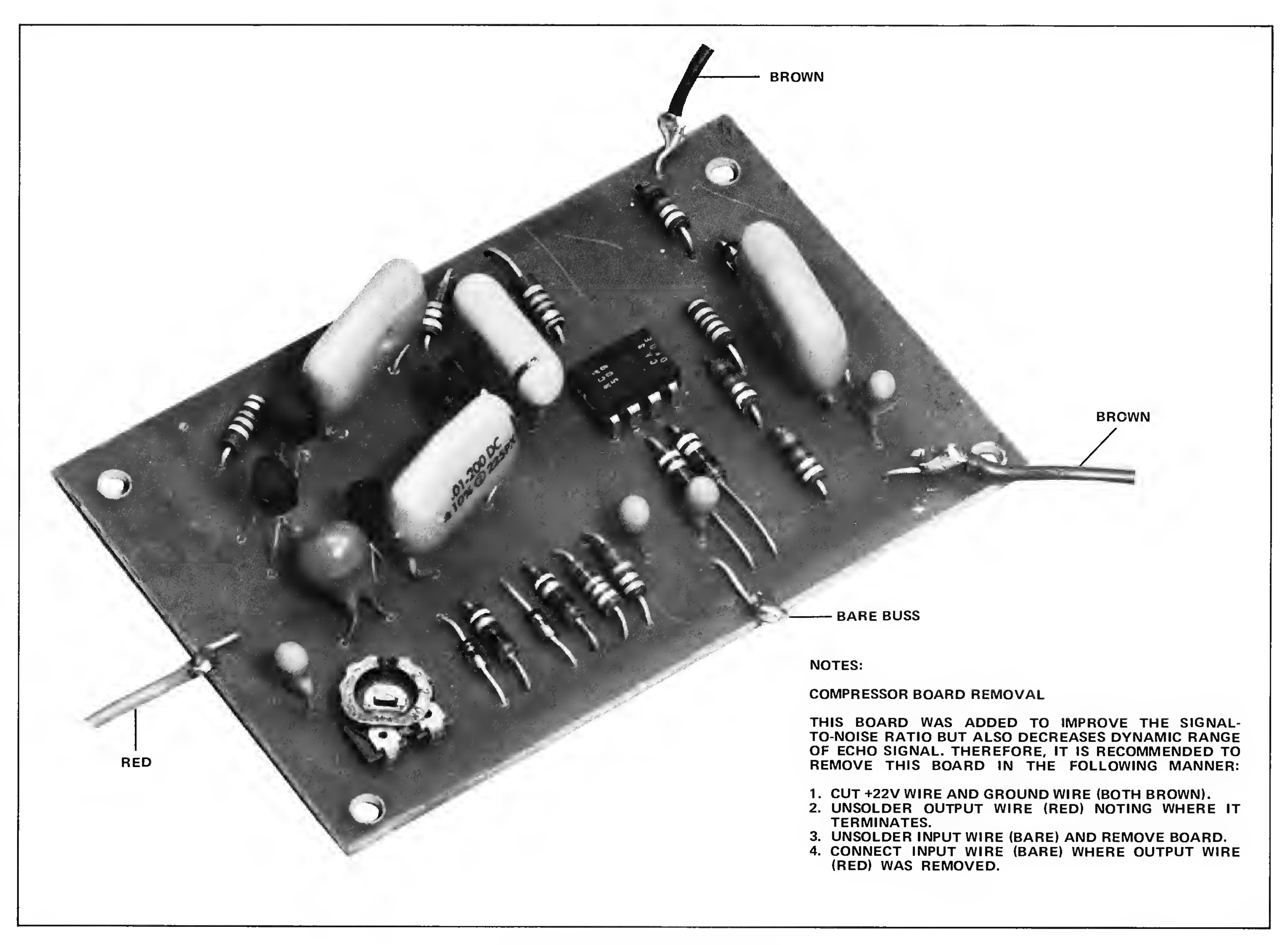
ECHOPLEX EP-3 SCHEMATIC DIAGRAM – SERIAL NO. 9451 TO 12960



ECHOPLEX EP-3 SCHEMATIC DIAGRAM – SERIAL NO. 12961 TO 28591



ECHOPLEX COMPRESSOR BOARD SCHEMATIC DIAGRAM



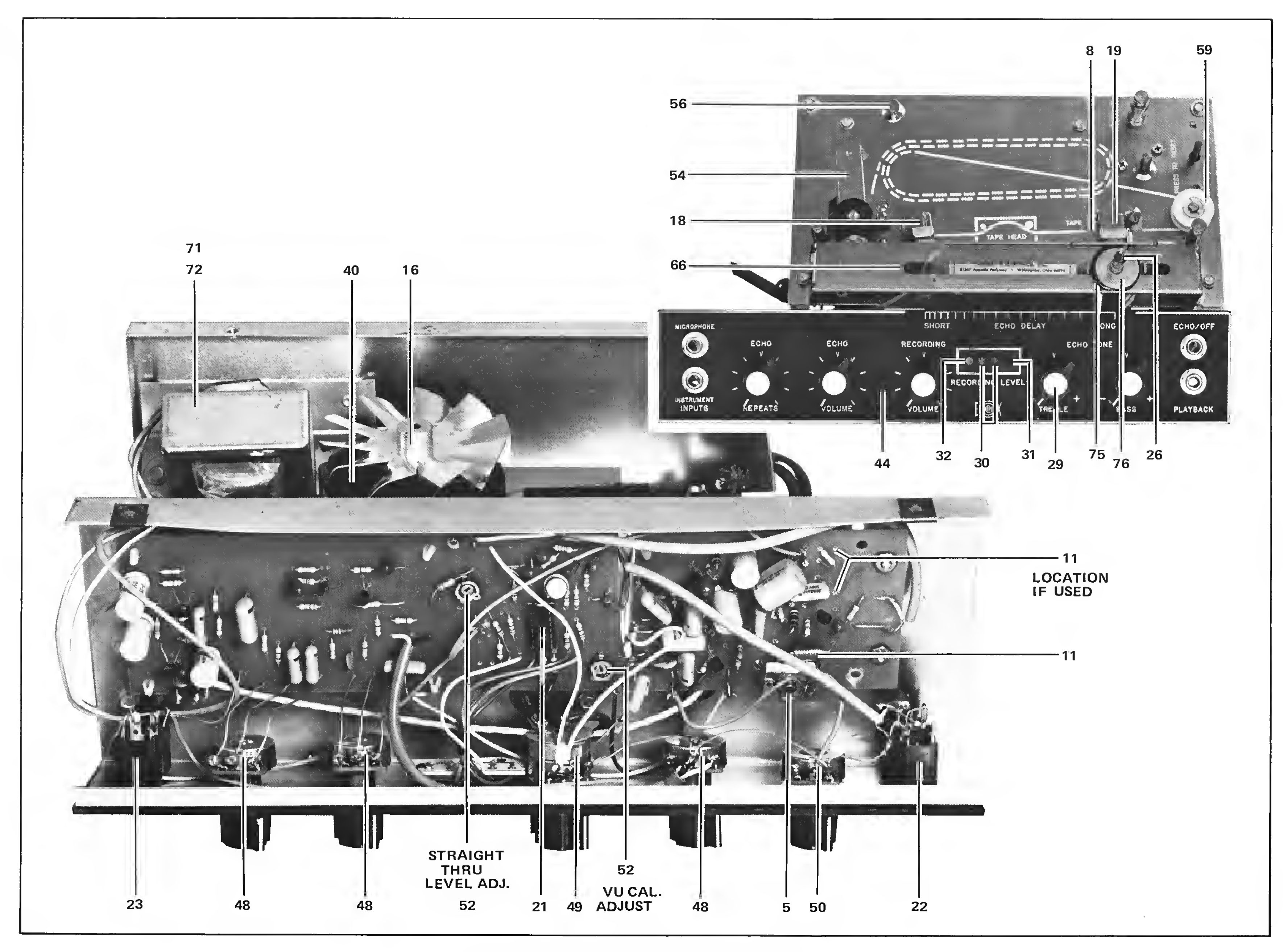
NOTES:

COMPRESSOR BOARD REMOVAL

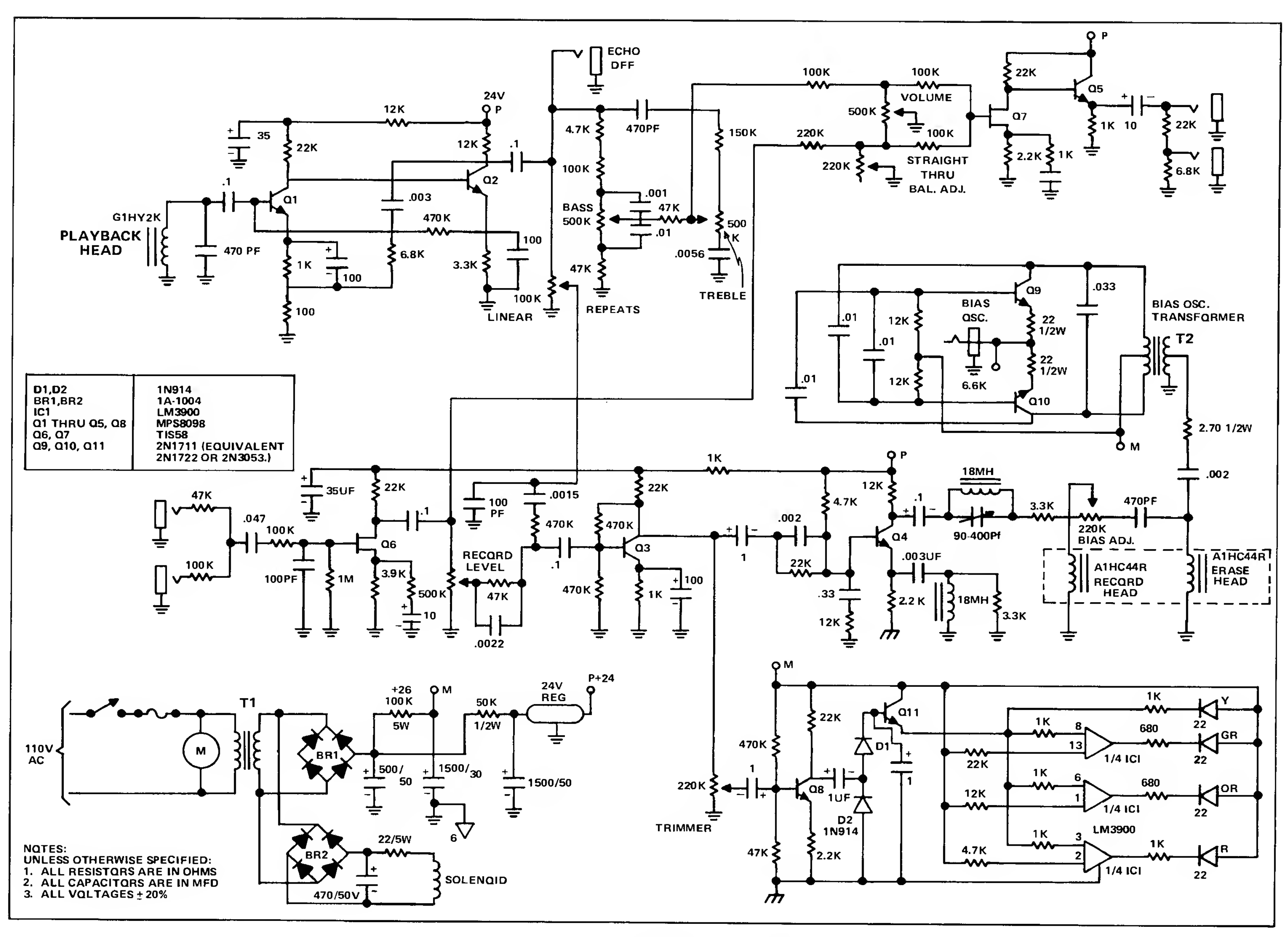
THIS BOARD WAS ADDED TO IMPROVE THE SIGNAL-TO-NOISE RATIO BUT ALSO DECREASES DYNAMIC RANGE OF ECHO SIGNAL. THEREFORE, IT IS RECOMMENDED TO REMOVE THIS BOARD IN THE FOLLOWING MANNER:

1. CUT +22V WIRE AND GROUND WIRE (BOTH BROWN).
2. UNSOLDER OUTPUT WIRE (RED) NOTING WHERE IT TERMINATES.
3. UNSOLDER INPUT WIRE (BARE) AND REMOVE BOARD.
4. CONNECT INPUT WIRE (BARE) WHERE OUTPUT WIRE (RED) WAS REMOVED.

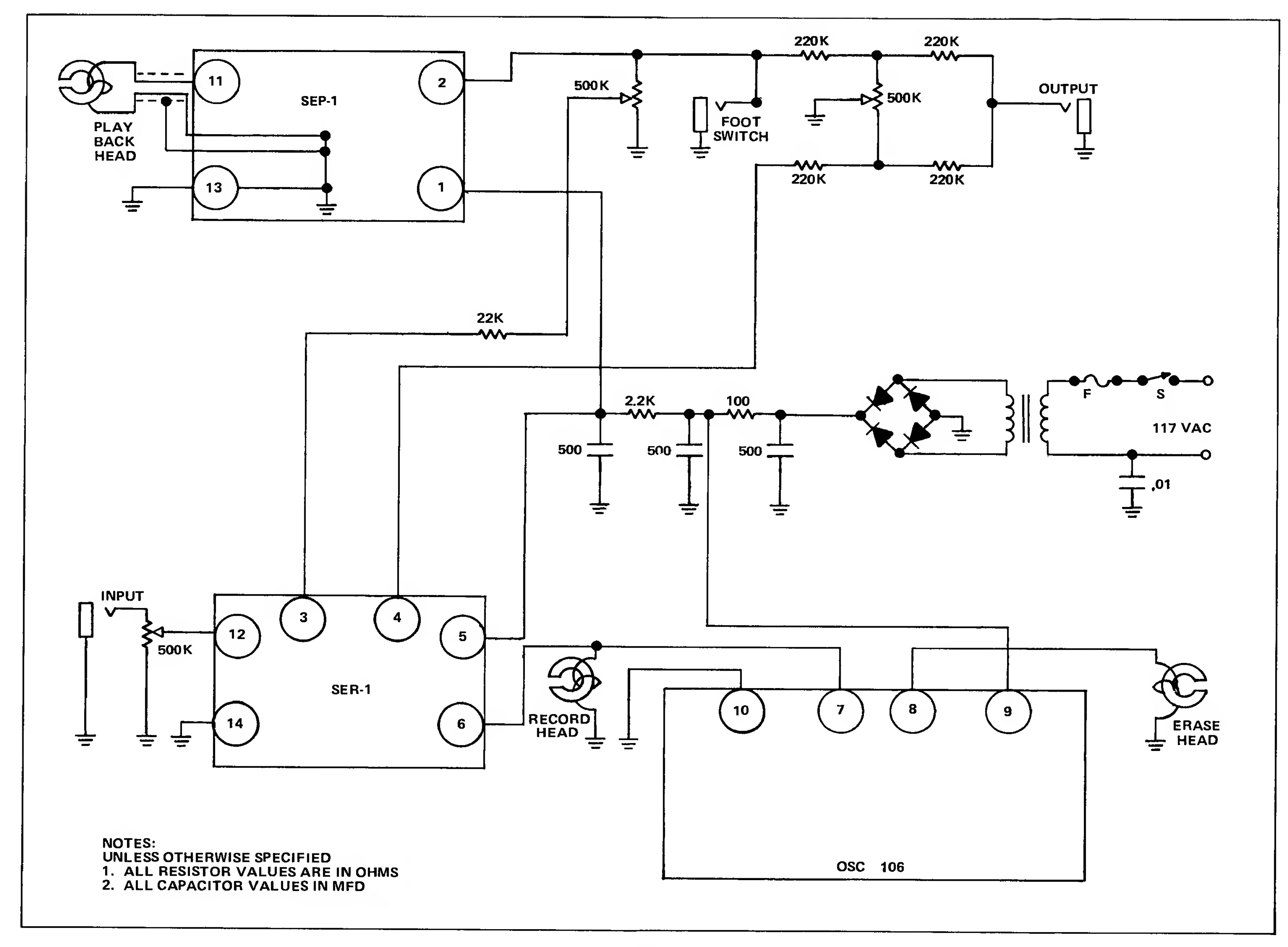
ECHOPLEX COMPRESSOR BOARD



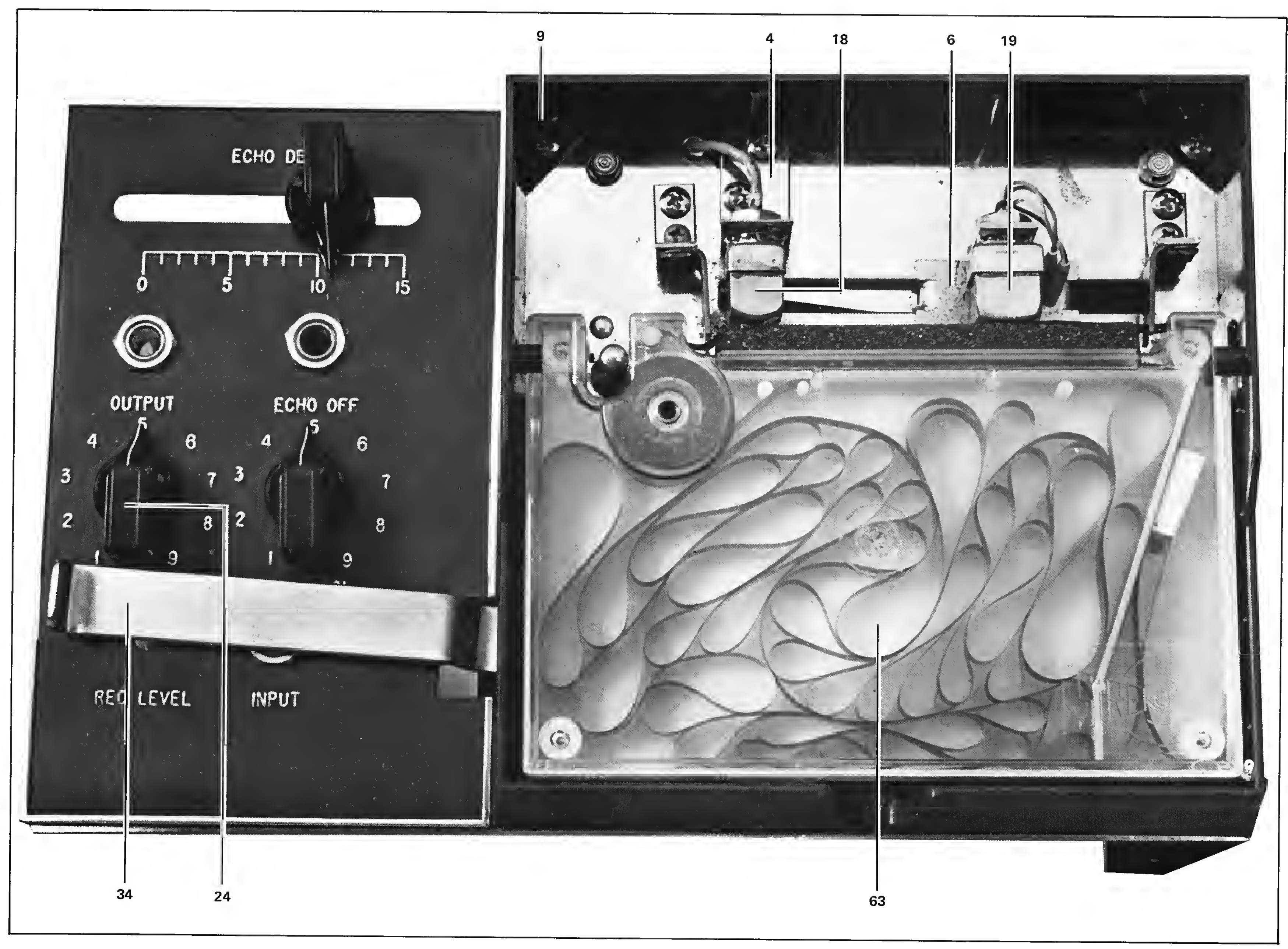
ECHOPLEX EP-4, TOP AND INSIDE VIEWS



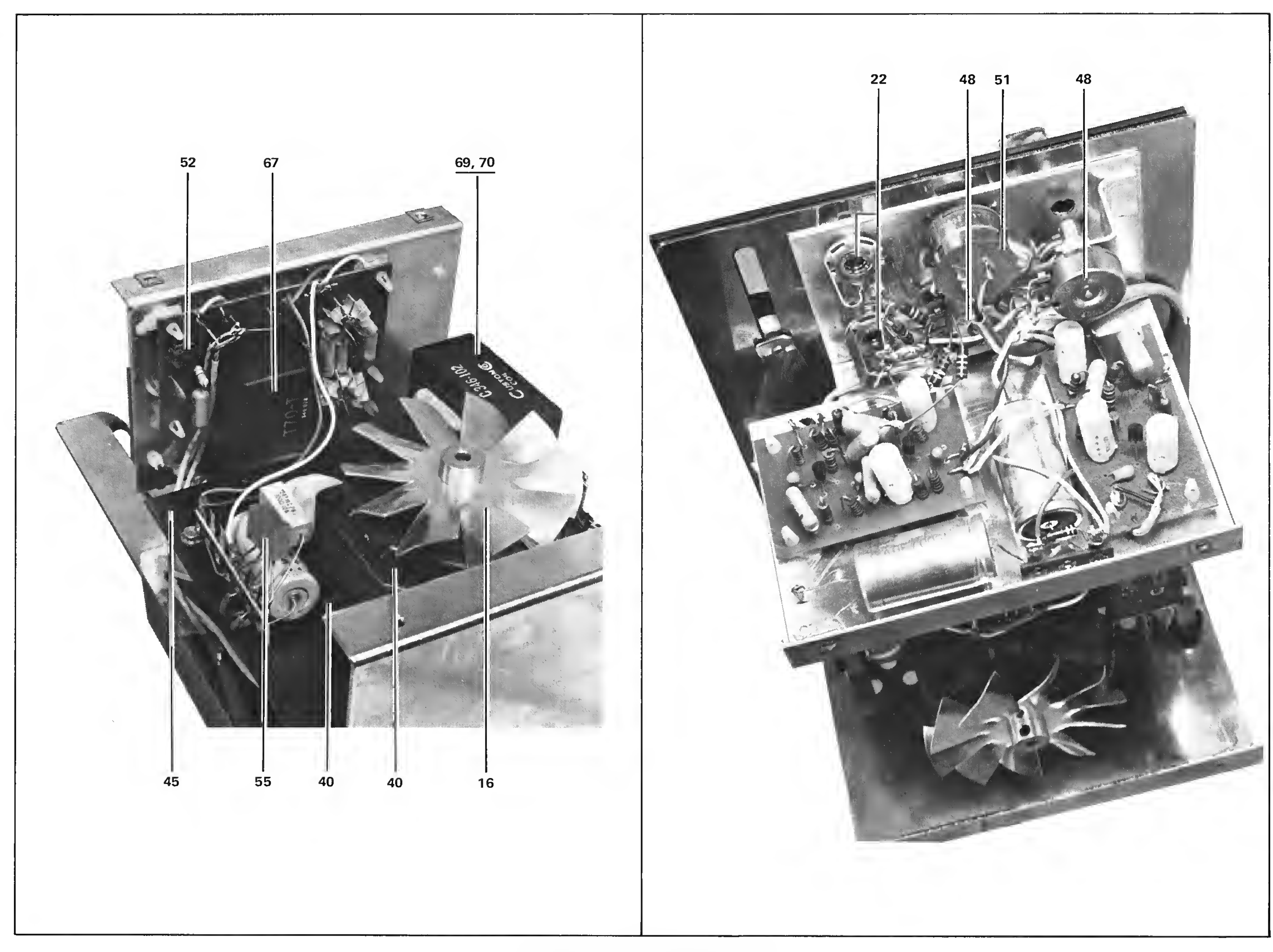
ECHOPLEX EP-4 SCHEMATIC DIAGRAM



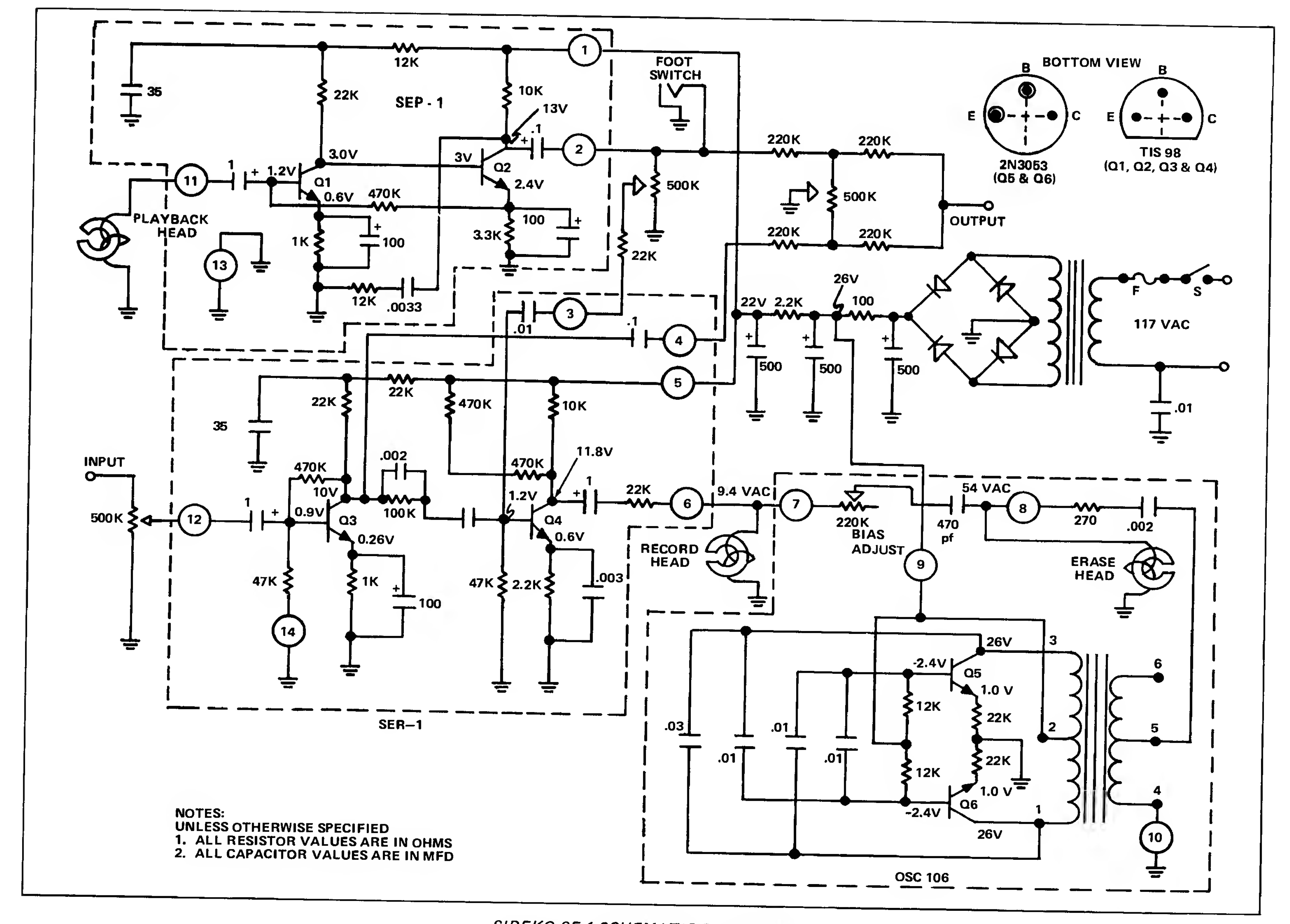
SIREKO SE-1 SCHEMATIC DIAGRAM – CIRCUIT BOARD HOOKUP



SIREKO SE-1, TOP VIEW



SIREKO SE-1, INSIDE VIEWS



SIREKO SE-1 SCHEMATIC DIAGRAM

SELECTED REPLACEMENT PARTS LIST

INDEX NO.	PART NUMBER	DESCRIPTION
1	962-043826-001	Bearing, Flywheel
2	964-043827-001	Bearing Cap, Flywheel
3	916-043233-001	Belt, Motor Drive, EP-1, EP-4, Groupmaster
	916-043233-001	Belt, Motor Drive, Sireko
4	961-043767-001	Bracket, Playback Head Mounting
	978-043399-001	Cabinet, EP-3, EP-4
	978-043768-001	Cabinet, Groupmaster
	978-043398-001	Cabinet, Sireko
5	944-043769-001	Capacitor, Var., Bias Trap, 90-400pfd
6	962-043770-001	Carrier, Movable Head, Sireko
7	962-043771-001	Carrier and Guide Post Assembly, Movable Head, EP-1, EP-2
8	962-043771-002	Carrier and Guide Post Assembly, Movable Head, EP-3, EP-4, Groupmaster
9	964-043772-001	Carrier, Tape Cartridge, Sireko
	932-043773-001	Carton Complex, EP-3, EP-4
	932-043774-001	Carton Complex, Sireko
10	956-043775-001	Choke, 10 mhy
11	956-043776-001	Choke, 18 mhy
12	939-043777-001	Circuit Breaker, .75 Ampere Hold
13	952-043778-001	Coil, Bias Oscillator
	964-043779-001	Cover, Tape Cartridge, EP-1, EP-4, Groupmaster
	964-043780-001	Cover, Tape Head, Sireko
	919-043147-001	Diode, 1N914
14	919-043244-001	Diode, Rectifier, EP-1, EP-2
15	919-041255-002	Diode, Zener, 1N4748A
16	962-043781-001	Fan, Echoplex, All Models
17	962-043782-001	Flywheel and Capstan Assembly, All Models
18	921-043156-001	Head, Playback, G1HY2K (S.O.S.)
19	921-043154-001	Head, Record-Erase, A1HC44R
20	921-043155-001	Head, Record-Erase, A1HC47R (Tube)

INDEX NO.	PART NUMBER	DESCRIPTION
46	935-043801-001	Plate, Flywheel Thrust Bearing, and Motor Mounting, Old Style Round Motor
47	935-043801-002	Plate, Flywheel Thrust Bearing, and Motor Mounting, New Style Square Motor
	910-042043-001	Plug, Phone, .250" 2 Conductor
48	925-043802-001	Potentiometer, Control, 500K Audio Taper
49	925-043802-002	Potentiometer, Control, 500K Audio Taper, with SPST Switch
50	925-043803-001	Potentiometer, Control, 100K Linear Taper
51	925-043804-002	Potentiometer, Control, 500K Linear Taper, with SPST Switch
52	925-043805-001	Potentiometer, Trim, 220K
53	935-043806-001	Pressure Roller Assembly, EP-1, EP-2
54	935-043806-002	Pressure Roller Assembly, EP-3, EP-4, Groupmaster
	928-043808-001	Pulley, Motor Drive, New Style Square Motor
	928-043807-001	Pulley, Motor Drive, Old Style Round Motor
	928-043809-001	Pulley, Motor Drive, Sireko
55	919-043149-001	Rectifier, Bridge, 1 Ampere, 100 PIV
56	903-043810-001	Screw, Knurled Thumb, Tape Cartridge and Tape Cover
57	921-043158-001	Solenoid, Pressure Roller, 115 Volt, For Serial Numbers 12960 and Below
58	921-043158-002	Solenoid, Pressure Roller, 24 Volt, For Serial Numbers 12961 and Above
59	964-043811-001	Spool, Tape Guide
60	975-043822-001	Spring, Pressure Roller Actuator

21	991-043148-001	Integrated Circuit, LM3900
	991-043783-001	Integrated Circuit, Voltage Regulator, UA78M24
22	910-041306-001	Jack, Phone, .250" 2 Conductor
23	910-041306-002	Jack, Phone, .250" 2 Conductor, N.C. Switch
24	915-043784-001	Knob, Front Panel, EP-1, EP-2, Sireko, Groupmaster
25	915-043785-001	Knob, Front Panel, EP-3, EP-4
26	915-043786-001	Knob, Movable Head Carrier
27	939-043787-001	Lamp, Recording, Groupmaster
28	939-043788-001	Lamp, Recording, EP-1, EP-2
29	939-043789-001	Lamp, Recording, EP-3, EP-4
30	939-041850-002	L.E.D., Green
31	939-041850-001	L.E.D., Red
32	939-041850-003	L.E.D., Yellow
33	911-043823-000	Lever, Pressure Roller Actuator
34	962-043790-001	Lever, Tape Cartridge Pressure, Sireko
	993-043791-001	Manual, Owners, EP-3
	993-043791-002	Manual, Owners, EP-4
	993-043791-003	Manual, Owners, Sireko
	993-043019-001	Manual, Owners and Service, All Models
35	935-043792-001	Meter, VU, Groupmaster
	935-043793-001	Meter, VU, EP4
36	921-043797-001	Motor, New Style, Square, 115 Volt
37	921-043797-002	Motor, New Style, Square, 230 Volt
38	921-043796-001	Motor, Old Style, Round, 115 Volt
39	921-043796-002	Motor, Old Style, Round, 230 Volt
40	916-043794-001	Mount, New Style Square Motor
41	916-043795-001	Mount, Old Style Round Motor
42	976-043798-001	Pad, Tape Pressure
43	913-043824-001	Panel, Front, EP-3
44	913-043825-001	Panel, Front, EP-4
	935-043799-001	Pedal, Foot Assembly
45	935-043800-001	Plate, Flywheel Thrust Bearing, and Motor Mounting, Sireko
61	960-043812-001	Switch, DPDT, Battery
	960-043004-001	Switch, SPST, Push, Foot Pedal
62	960-043813-001	Switch, DPDT, Toggle
63	935-043253-001	Tape Cartridge, Sireko
64	935-043252-001	Tape Cartridge, 3 Minute, EP-1, EP-4, Groupmaster
65	932-043252-002	Tape Cartridge, 4 Minute, EP-1, EP-4, Groupmaster
66	961-043814-001	Track, Movable Head
67	954-043153-001	Transformer, Bias Oscillator, T70-T2
68	954-043815-001	Transformer, EP-1, EP-2, 115 Volt
69	954-043157-001	Transformer, EP-3, Sireko, Groupmaster, 115 Volt
70	954-043157-002	Transformer, EP-3, Sireko, Groupmaster, 230 Volt
71	954-043816-001	Transformer, EP-4, 115 Volt
72	954-043816-002	Transformer, EP-4, 230 Volt
	991-041145-001	Transistor, Field Effect, TIS58
	991-043150-001	Transistor, MPS8098
	991-041160-001	Transistor, TIS98
	991-043817-001	Transistor, 2N1711
	991-043146-001	Transistor, 2N3053
73	990-043818-001	Vacuum Tube, 6C4
74	990-043819-001	Vacuum Tube, 6EU7
75	904-043820-001	Washer, Rubber, Movable Head Carrier
76	904-043821-001	Washer, Steel, Movable Head Carrier

ECHOPLEX

Another Quality Product from Norlin

MOOG MUSIC INC.
2500 Walden Avenue, Buffalo, New York 14225

NORLIN MUSIC
7373 N. Cicero Avenue, Lincolnwood, Illinois 60646

NORLIN MUSIC INSTRUMENTS LIMITED
51 Nantucket Blvd., Scarborough, Ontario, Canada MIP 2N6

NORLIN MUSIC LIMITED
114 Charing Cross Road, London, England

NORLIN MUSIC SERVICES B.V.
Waalhaven Zuidzijde 48, 3088 H. J., Rotterdam, The Netherlands

Manufactured for Norlin by
MARKET ELECTRONICS
38367 Apollo Parkway, Willoughby, Ohio 44094

PRINTED IN U.S.A.
993-043019-001
T.G. – 2/79 – 1M



TM



Factory Service Bulletin

2500 WALDEN AVE. • BUFFALO, NEW YORK 14225 • UNITED STATES
51 NANTUCKET BLVD. • SCARBOROUGH, ONT. MIP 2N6 • CANADA
WAALHAVEN • Z.Z. 48 ROTTERDAM • THE NETHERLANDS

SUBJECT: Echoplex Owners and Service Manual Addendum, Manual No. 993-043019-001 — NUMBER: 7901 — DATE: 10/79

This Bulletin requires that the information be revised on the pages noted prior to servicing the equipment. Please make these changes and add this addendum to the manual.

In addition a circuit description referring to the solid state EP-3 shown on pages 25, 26, 27 and a photograph, schematic and selected replacement parts list are included for Echoplex EP-3 Models with Serial Numbers Approximately 23,700 through 24,000.

> **NOTICE**
>
> Moog music will honor the warranty for any Echoplex product below serial number 35900. Serial numbers above 35900 will be warrantied directly by Market Electronics.

A. TEXT CHANGES

Pages 2 and 4, fourth paragraph under FEATURES, revise to read as follows:

Exclusive Echoplex replaceable three-minute tape cartridge included.

Page 4, under NOTE following last paragraph under POWER SOURCE, revise to read as follows:

> **NOTE**
>
> OUTPUT jacks are located in the compartment area. The forward jack is for musical instrument amplifiers. The rear jack is a high level, emitter follower output, for use with high or low impedence PA mixer panels.

Page 5, under RECORD LEVEL ADJUSTMENT, revise to read as follows:

During performance, advance the RECORDING VOLUME CONTROL so that as the louder peaks are played, the green area will be active.

If only yellow is indicated, then too little volume is being recorded on tape. This may cause you to turn up amplifier volume to the point where tape "hiss" is objectionable.

Echoplex signal to noise ratio is better than 50dB, and if recordings are made at the proper level, tape "hiss" will not be objectionable.

A. TEXT CHANGES (Continued)

Page 11, under PLAYBACK HEAD, revise to read as follows:

b) Using needle nose pliers, gently bend playback head mounting bracket up and down until the maximum sine wave is obtained. Use caution not to break metal bracket loose from bridge. Move slider across and observe level change less than ± 3dB. If out of specification, repeat step b) with ECHO DELAY at MINIMUM.

g) Return signal generator to 1000Hz. Turn ECHO SUSTAIN control to position "1". Turn ECHO VOLUME control to position "9". Using a small screwdriver, adjust level by matching sine waves on ECHO VOLUME control in positions "1" and "9."

Page 11, under SOUND ON SOUND HEAD ALIGNMENT, revise to read as follows:

a) Record approximately one minute of 1000Hz, no echoing, and approximately one minute of 6000Hz, no echoing.
b) Place foot switch in PLAYBACK jack, and shut off when record time is complete. Place ECHO SOUND ON SOUND switch to the SOUND ON SOUND position.

d) Turn foot switch on. During 1000Hz playback, with switch in SOUND ON SOUND position, note output level.

e) Each time the 1000Hz passes, the output should drop approximately 1dB (10%). If output does not drop 1dB, turn the trimmer potentiometer a little more until the desired results are obtained.

Pages 25, 26 and 27 under NOTES, revise to read:

3. ○ INDICATES PC BOARD TERMINALS.

⚠5 ADJUST FOR MAX. OUTPUT 1kHz, -20dB INPUT. ECHO SUSTAIN =1, ECHO VOL. = 9.

⚠7 ADJUST FOR MAX. UNDISTORTED OUTPUT. -20dB 1kHz INPUT. ECHO SUSTAIN =1, ECHO VOL. = 9.

Pages 25, 26 and 27 Schematic Diagrams.
a) Resistor on emitter of Q4 should be 2.2K, not 22K.
b) Source resistor of Q5, a 3.3K ohm resistor, should have an .022uf capacitor across it.

B. CIRCUIT DESCRIPTION

This circuit description refers to the most commonly manufactured solid state EP-3 models as described on pages 25, 26 and 27.

B. CIRCUIT DESPRIPTION (Continued)

POWER SUPPLY

The power supply is a standard full-wave bridge with a raw DC tap feeding the bias oscillator and a 22V Zener diode feeding the audio sections.

INPUT SECTION

The input section is AC coupled to Q5 with a gain of 16.5dB (6.7X). Pre-emphasis is accomplished with a 3.3K resistor and a .22uf capacitor on the source of Q5 (fc=2.2kHz, 6dB/octave). The straight signal is fed from pin 2 and the echo is fed from pin 23.

RECORD AMPLIFIER

A two-transistor stage consisting of Q3 and Q4 has a gain determined by the B of Q3. The overall echo gain is adjusted with the RECORD LEVEL potentiometer at unity gain with a -20dB, lkHz input signal. The bias trap is adjusted to block the bias oscillator from the audio chain.

BIAS OSCILLATOR

This is a two-transistor oscillator consisting of Q7, Q6, T2 and associated components. Operation is at an approximate frequency of 100 KC which feeds the Erase Head, and through the BIAS ADJUST control, the Record Head. The bias is adjusted for maximum with a -20dB, 1kHz input.

HEAD AMPLIFIER

The head amplifier consists of transistors Q1 and Q2. The signal is de-emphasized through a.033uf capacitor and an 18K ohm resistor on the collector of Q2. Overall gain is approximately 60dB at 1kHz of this circuit.

AUDIO OUTPUT

The output is variable from full straight signal to full echo signal by means of an ECHO VOLUME control which shunts the unwanted signal to ground.

SOUND ON SOUND (SOS) VERSUS ECHO

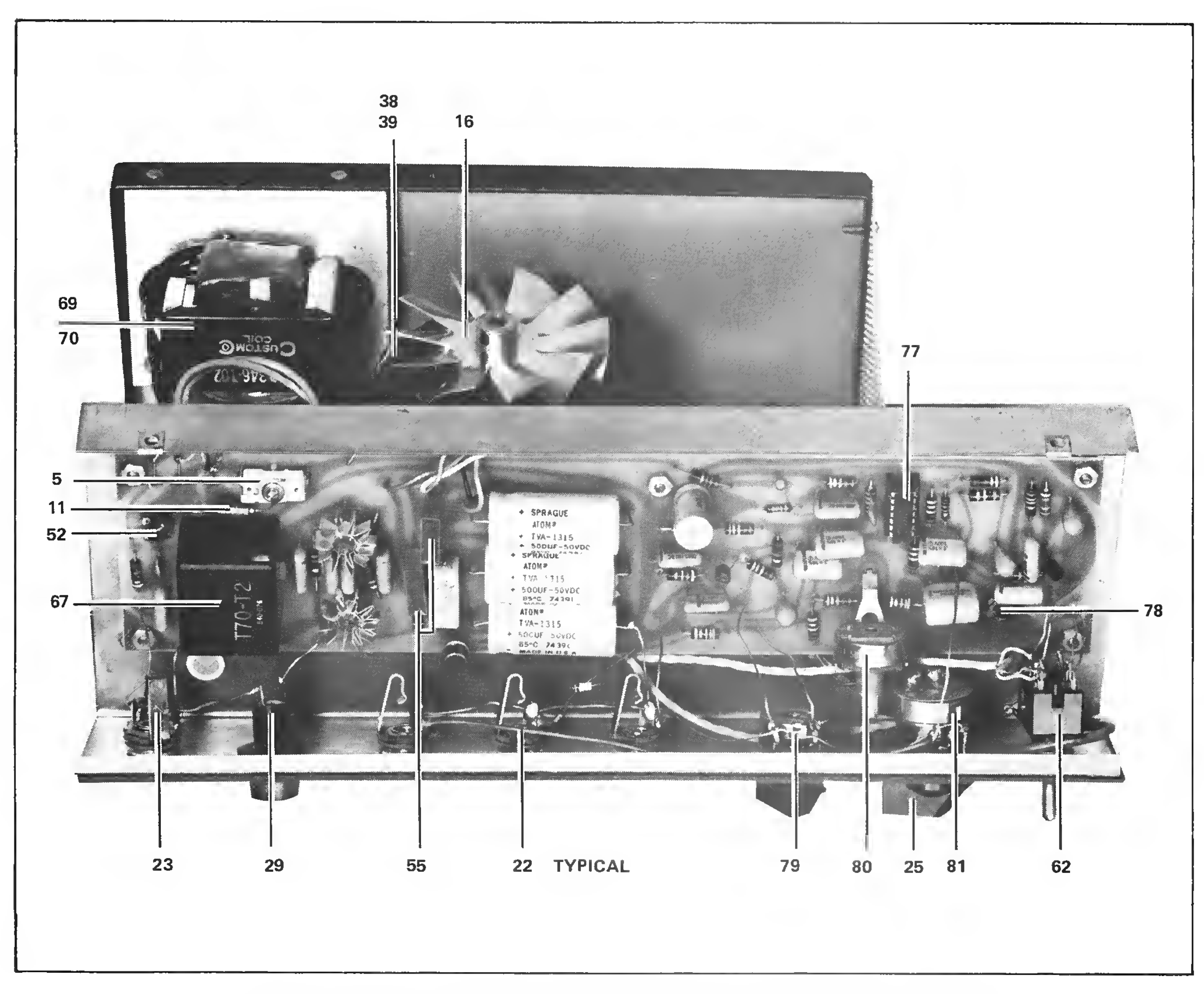
The tape head amplifier has two inputs, either the Echo Head or SOS Head. When the SOS position is selected the previous recording on the tape is re-recorded in a degenerating fashion (1dB per pass along with the input signal applied). The SOS Head precedes the Record/Erase Head in the tape flow path, so no echo is available in this position. When the ECHO position is selected the previous recording is picked up by theEcho Head (keep in mind the Echo Head is after the Record/Erase Head in tape flow) and re-recorded with the input signal, which results in an echo. The number of echos is varied through a 500K ohm ECHO SUSTAIN control from one echo (100% degeneration) to continuous regeneration (100%). The ECHO DELAY is selected by positioning the Record/ Erase Head.

C. ECHOPLEX EP-3 (SERIAL NUMBERS APPROXIMATELY 23,700 THROUGH 24,000)

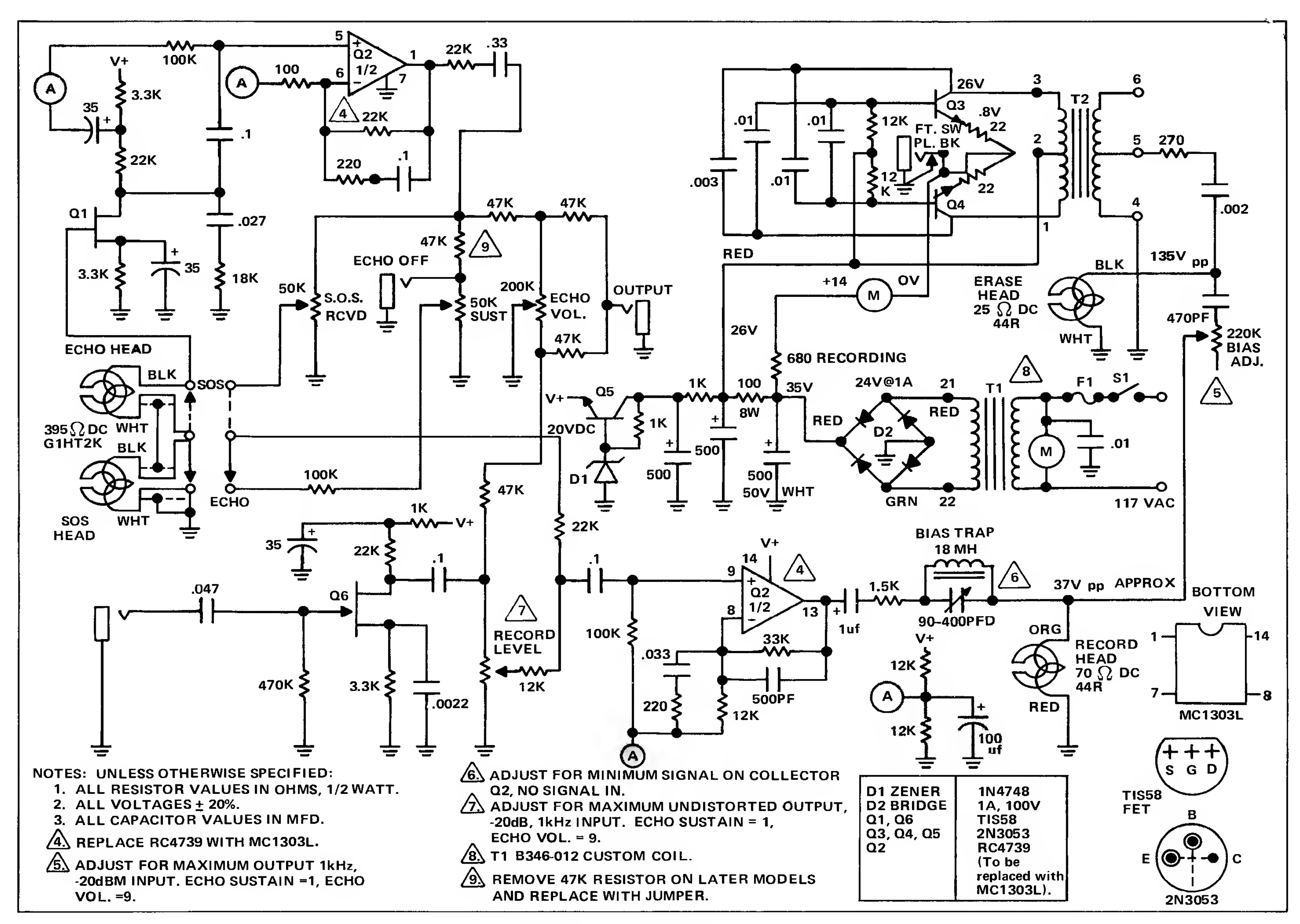
PARTS LIST

Additional parts required to include single board EP-3 with 4739 IC, serial numbers approximately 23,700 through 24,000. Replace 4739IC with MC1303L IC.

INDEX NO.	PART NUMBER	DESCRIPTION
77	991-043036-001	Integrated Circuit, MC1303L
78	925-040281-010	Potentiometer, Trim 50K Ohm
79	925-043846-001	Potentiometer, Control 1, 200K Ohm Audio
80	925-043847-001	Potentiometer, Control
81	925-043848-001	Potentiometer, Control With SPST Switch, 50K Ohm Linear



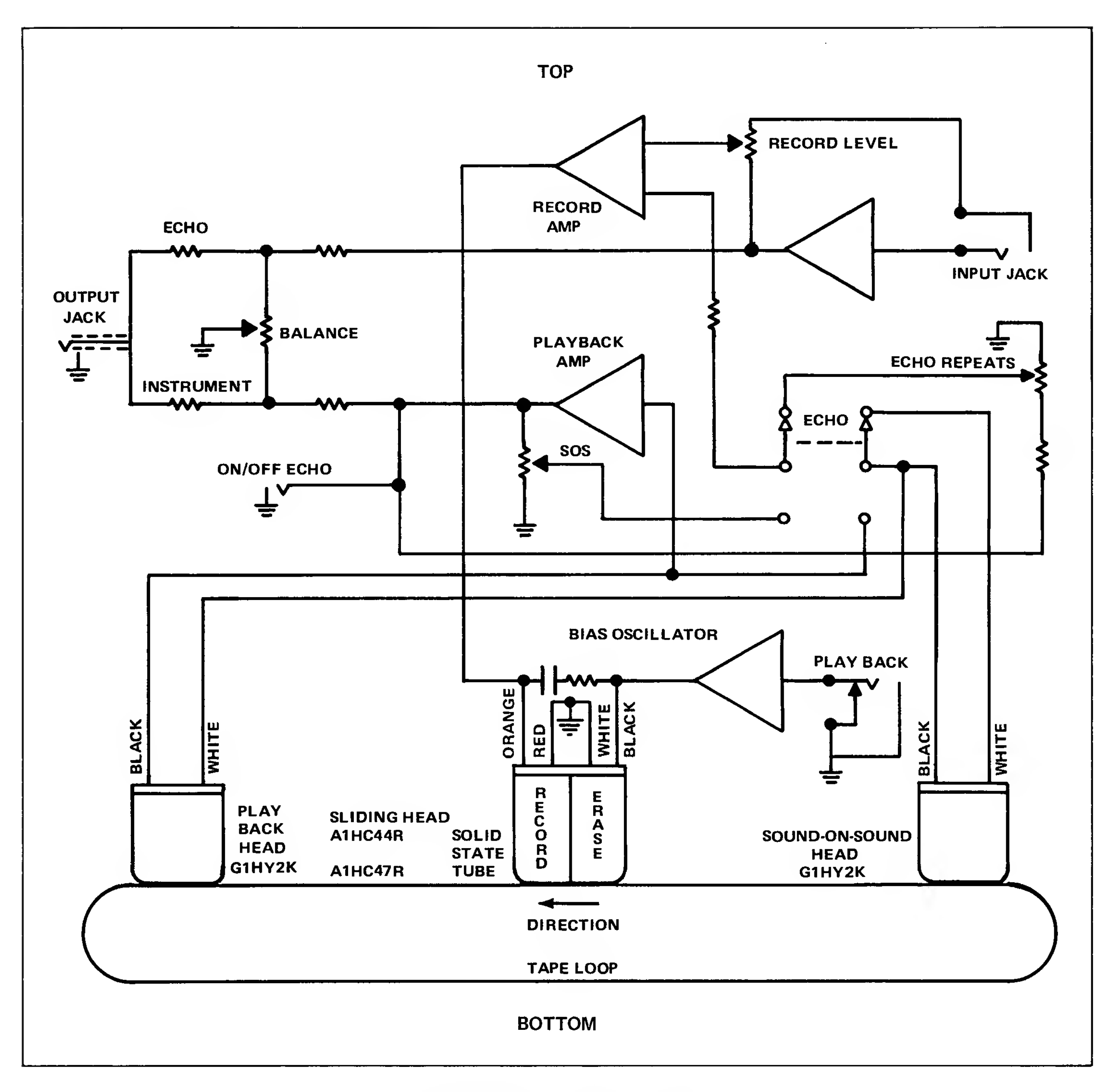
ECHOPLEX 3 (SERIAL NUMBERS APPROXIMATELY 23,700 THROUGH 24,000)



ECHOPLEX 3 (SERIAL NUMBERS APPROXIMATELY 23,700 THROUGH 24,000)

D. FUNCTIONAL BLOCK DIAGRAM

Page 10, change diagram as follows:



FUNCTIONAL BLOCK DIAGRAM
OF ECHOPLEX AND GROUPMASTER UNIT